PETROLEUM WEEK

JULY 27, 1956

■ A McGRAW-HILL PUBLICATION

Tough problem!

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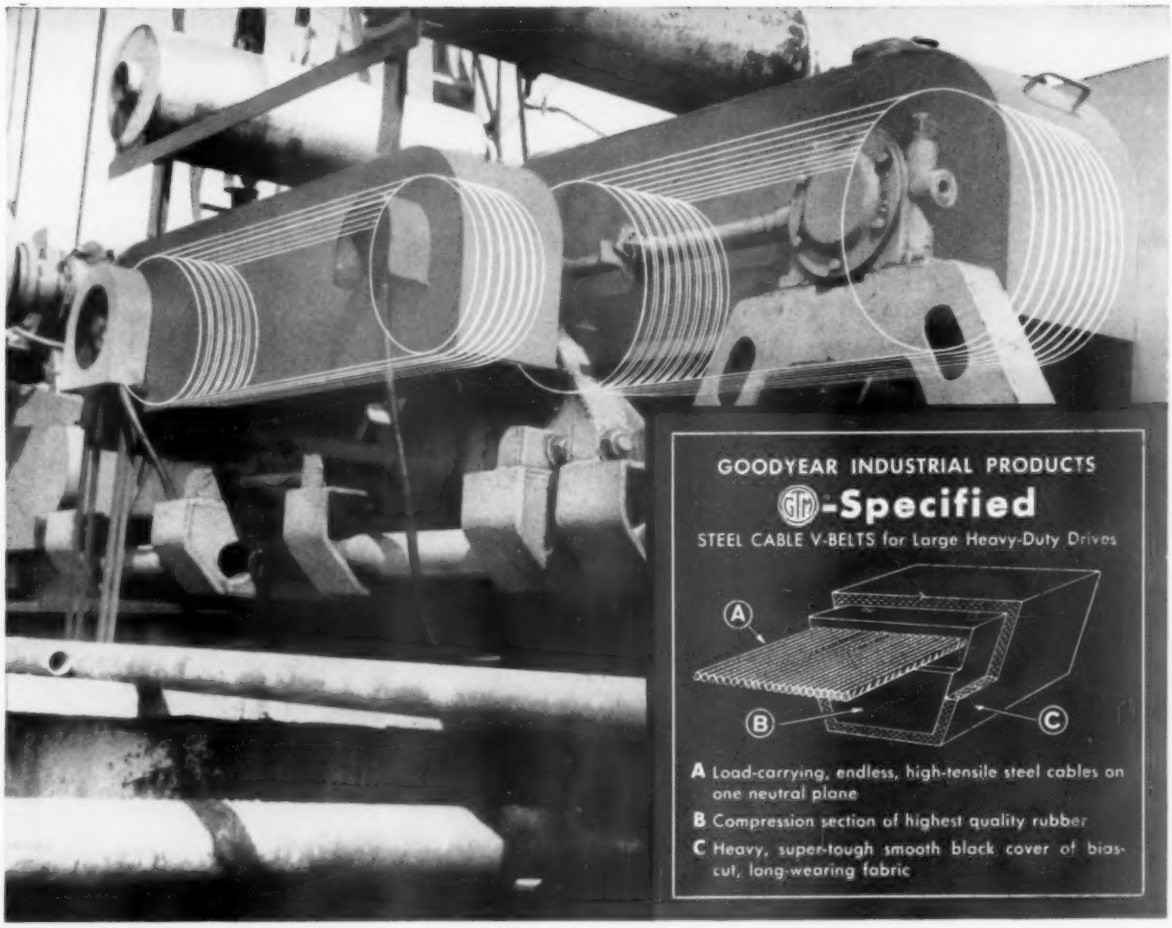
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July 27, 1956

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This page will be perforated from now on so that you can tear it out and file it if you wish.

Shell is going to stick to two grades of gasoline. Its new grade, "Super Shell with TCP," will supplant its present premium fuel. First sale, starting next Tuesday, will be in the Gulf Coast area, but it will be extended to the Atlantic seaboard as soon as supply is available.

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An end to the steel strike doesn't mean an end to oil problems arising from it. The biggest worry: With crude and oil products in ample supply, how can a steel price hike be passed along? . . . p. 9

•

A grand jury has returned three indictments in the gas bill "influence" case—and political repercussions are likely. Republicans, long vexed at Democratic charges of big-business control, may try to make hay out of the charge that Superior Oil Co. and two attorneys—John Neff and Elmer Patman—used illegal means in pushing the gas bill. . . . p. 11

•

Oil sands in California's Midway-Sunset field have been ignited in a $1-million test of "in situ" combustion. Real objective of the test: to determine whether thermal recovery is economic. . . . p. 14

•

Esso Research & Engineering Co. is stressing "work simplification" for its engineers and scientists. The company has saved $1-million in a year-old program that until now has featured a "work smarter" appeal to non-professional employees. . . . p. 27

•

A strong effort is being made to unite independent oil men on a proposal for limiting imports. A meeting of 21 oil groups was under way in Washington this weekend to discuss TIPRO's sliding scale tariff plan. And IPAA was meeting with Defense Mobilizer Flemming. . . . p. 6

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The Senate Small Business Committee isn't proposing any legislation affecting oil marketing. In a report this week, based largely on New Jersey price war hearings, the committee is critical, but does not suggest government controls or marketing divorcement. It does urge the Justice Dept. and FTC to make studies however.

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A big scramble for mothballed U. S. vessels may affect tanker rates. Oil men are watching while both oil and dry-cargo operators try to tap reserve-fleet tonnage. . . . p. 19

•

Sinclair is bolstering its crude supply through a $107½-million deal to buy Southern Production Co. It's another indication of the growing industry trend to buy oil that's already been found. . . . p. 11

Looking Ahead in Washington

McGraw-Hill
Washington
Bureau
July 27, 1956

A showdown is near on voluntary oil-import restrictions. Defense Mobilizer Arthur Flemming faces a revolt by independent producers, who feel the voluntary program has failed. Producers are girding to fight for new legislation next year unless the government does more to hold imports to their 1954 relation to U. S. production.

Independents are trying to close ranks on a new approach. Representatives of 21 oil groups are conferring in Washington on the plan for a graduated oil tariff proposed by the Texas Independent Producers & Royalty Owners Assn. (PW—Jul.20'56,p9), and Robert L. Wood, president of the Independent Petroleum Assn. of America, is meeting with Flemming today (July 27) to emphasize his group's dissatisfaction with current imports situation.

A new push for trade restrictions will face tough obstacles on Capitol Hill. Both parties are committed to liberal trade policies. A joint congressional economic subcommittee has just taken a slap at the whole concept of trade restrictions based on defense essentiality. The group says direct subsidies to defense-essential industries would be better. Still, a hard-to-stop protectionist bloc could emerge if independent producers get together with other domestic industries, such as textiles and watches, which want help against imports, too.

•

Oil and gas leasing on public lands will be investigated. The law limits maximum holdings on such leases in any one state to 46,080 acres, plus options on another 200,000 acres. A Senate Interior subcommittee plans hearings on reports that some lessees are exceeding the maximums. The investigators face a tough job, however, since many leases are held indirectly and true ownership is hard to trace.

•

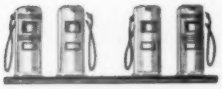
Congress is watching the Delhi-Taylor contract with the Navajos. The agreement, under which the Dallas firm would undertake oil and gas development on the huge Indian reservation on a partnership basis, is under fire from companies that claim leases should be issued on competitive bidding. A congressional investigation has been demanded. But the House and Senate Interior Committees are in no mood now to interfere with the contract, which is still under study at the Interior Dept.

•

Overseas oil-equipment shipments may be cheaper next year. The House Merchant Marine Committee will push a bill aimed at reducing use of freight forwarders by oil and other companies. It would authorize ocean carriers to reduce freight rates where forwarders are not used. The committee says many forwarders do nothing to earn their cut anyway.

•

U. S. officials are evaluating standby gasoline-rationing plans. During Operation Alert, aimed at testing government preparations for an atomic attack on the U. S., mock orders were issued under which gasoline could be sold only to persons engaged in survival work, civil defense operations, and essential civilian services. On-the-spot control would be exercised by military or civil defense officials.



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Steel Prices Pose Oil Problems

The steel strike is in its fourth week. Negotiations have been resumed, bringing some hope that a settlement is in the offing. If not, there is a chance the President may take action.

Meanwhile, the strike creates a two-way worry for oil men: the immediate problem of getting steel supplies; and even more important, the steel price hike that lies ahead.

The coming higher steel prices will hit the petroleum industry with its economics down. Drilling contractors, producers, refiners, and marketers will find it difficult to make offsetting price increases for their services and products.

In brief, that's the opinion oil men around the country gave PETROLEUM WEEK reporters this week.

Demand for oil is running at a record clip so far this year. And even with the industrial shutdowns caused by the steel strike, it still looks as if 1956 will be a record year for oil consumption (PW—Jun.29'56,p10). But demand is only half of the industry's over-all economic picture.

It's the record rate of petroleum supply this year that will limit—and even hold back—price increases for crude oil and products that nearly all oil men say should be made when steel goes up.

The supply of petroleum from peak rates of imports and domestic production, and the high level of total finished-product stocks, due to record refinery operations are the offsetting factors that will make general price increases difficult.

Early in the year, the rate of new supply was running a little under demand. And many producers talked of —and expected to get—higher postings for domestic crude.

But with a high rate of domestic production and imports continuing through the spring and summer as demand moved downward in its normal seasonal pattern, the chief subject of conversation among producers changed from higher prices to holding existing wellhead postings.

The conversation, though, hasn't done much good in some areas. Price cuts of from 4¢ to 10¢ a bbl. have been posted recently in some fields in Illinois, Michigan, Oklahoma, West Texas, and Wyoming.

Product prices generally have been strong so far this year, but the outlook isn't the best in the world. There is an oversupply of gasoline and gasoline prices have moved lower in some sections of the East recently.

Too, a lot of fuel oil consumption may be completely lost because of the steel strike.

Most oil men are looking for a steel price hike averaging between $14 and $15 a ton. That's the immediate increase. But by the time the impact of higher steel prices hits other industries that sell to oil, the accumulating cost to the petroleum industry will be much higher.

A medium-sized integrated company in the Southwest estimates privately that, in the long run, the steel price hike will cost it $10-million on an annual basis.

Admittedly, this company's annual costs won't go up by $10-million right away. But, officials of the company say, when you add up the impact of a $14-a-ton hike in steel prices on all the equipment items the company buys—ranging from automobiles to machinery of all types—plus the eventual impact of higher steel wages on oil-industry pay scales, "it will mean $10-million annually to our company."

(A larger West Coast company estimates that a 10% hike in basic steel prices would cost it $9.4-million over the next 12-month period.)

An integrated company in the Mid-Continent area figures that a $14-a-ton hike in steel prices would cost it about $4½-million annually, of which $2¼-million would consist of added costs of oil country tubular goods.

Many drilling contractors say that higher steel prices will squeeze their profit margins close to the breaking point.

An increase in steel prices, says J. Alvin Gardner, of Gardner Bros. Drilling Co., Dallas, "will knock the socks off all of us. We can't raise the contract price for fear some cut-throat competitor will take the job away."

(Gardner Bros. drills mostly for major companies in the deep, hard-drilling areas. A lot of these wells go to 12,000 ft. and 14,000 ft. The firm is drilling two wells now below 15,000 ft.)

"Companies expect us to use all new drillpipe, especially in West Texas, which is the hardest drilling area of all that we encounter," Gardner says. "You wear out pipe fast out there," he adds.

"Contractors can use old pipe in California and on the Gulf Coast," he says. "It looks as if we're going to have to get some of that alluvial-soil trade to even things up."

An Oklahoma contractor, who operates 27 rotaries, estimates that the anticipated steel price hike will cost him from $300,000 to $400,000 more a year. "When steel prices go up," he claims, "everybody passes their added costs down to us and it's impossible for us to pass all of the increases down to our customers."

The president of another Oklahoma drilling firm says flatly that drilling contractors just can't absorb any additional costs. And he says the competition is such that several contractors are bidding on every job.

"There's no such thing as a field contract price any more," he says.

Dale Mount, president of the Amer-

ican Assn. of Oilwell Drilling Contractors, estimates that a $14 to $15 hike in steel will boost drilling costs between 7% and 10%.

Mount doesn't agree with drillers who say they can't raise their contract prices, though "most companies are willing to pay a reasonable figure for contract drilling," he says. "Most contractors should have no trouble getting the higher prices required."

Most oil industry officials expect that higher steel prices will have little, if any, real effect on drilling or expansion programs.

The anticipated price increase will have no effect on Magnolia Petroleum's drilling program, according to R. M. Chan, first vice-president of the Socony Mobil affiliate. Chan says that "practically all of Magnolia's drilling is on the basis of requirements to meet expiring leases, offset problems, and drainage problems. We will go ahead with our program regardless of any increase in costs."

D. V. Loflin, vice-president of General American Oil Co., of Dallas, Texas, says a steel price hike of around $14 a ton would up his company's drilling costs between 6% and 8%. He doesn't expect such an increase to have any serious impact on General American's drilling program. However, higher prices might tend to stop some wildcatting, he says, but practically all of the company's drilling is on producing leases.

A Mid-Continent major estimates that a $14-a-ton increase in steel would mean that about 1,000 fewer wells would be drilled in the U.S. over a 12-month period. An immediate hike in steel prices, this company figures, may knock 500 wells from planned programs during the remainder of this year alone.

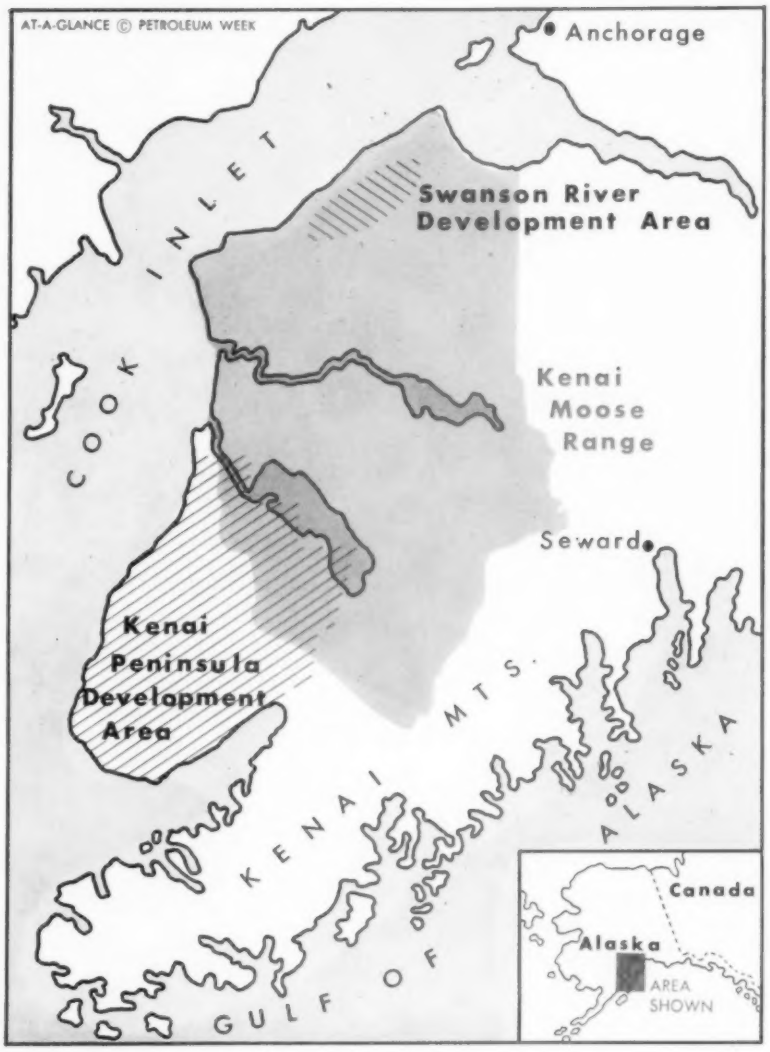
Companies contacted by PETROLEUM WEEK reported no major building projects will have to be shelved because of higher prices.

Some steel industry officials feel, however, that even if higher steel prices won't hurt steel users, a shortage of steel will.

These officials say shortages of plate and structural shapes—items which were tight before the strike—are hitting several industries, including oil.

They warn that the long-range effects could be serious.

Iron Age predicts that steel production may be curtailed next winter because of a possible shortage of iron ore. Strike-induced shutdown of ore mines and tying up of lake boats deprive stockpiles of the needed surpluses to carry operations through the winter months.



Moose Range Oil Hunt Looms

A limited congressional go-ahead to oil companies to hunt for oil in an Alaskan moose refuge seemed assured this week.

The areas involved are portions of the 2,057,197-acre Kenai National Moose range, in south Alaska (map).

Plans for opening of the region, as proposed by the Interior Dept., were discussed at a hearing held this week by the House Merchant Marine & Fisheries committee.

The committee was assured that operations approved so far would not endanger the moose. Under a Mar. 21 agreement, Interior must consult with the House group before approving any oil and gas development plans on wildlife refuges.

Interior Dept. plans include issuance of oil and gas leases on 71,680 acres in the Swanson River development area, and possible issuance of leases on 165,000 acres of Kenai Peninsula development area.

A proposed unit agreement already has been worked out for the Swanson River area by Richfield Oil Corp., Union Oil Co. of California, and Ohio Oil Co. Richfield, which will act as unit operator, presently plans only one test well.

Standard Oil Co. of California already holds a development contract for the Kenai Peninsula area. But no unit agreements have been worked out with lease applicants, and no test wells are planned yet.

Many leases have been issued for other Alaskan areas—including million-acre holdings by Phillips Petroleum Co. and Colorado Oil & Gas Corp. But development has been slow, because of weather, inaccessibility, and terrain.

More Crude for Sinclair

Purchase of Southern Production Co. for $107½-million would give crude-hungry Sinclair big new U. S. reserves, plus a firmer toehold in Canada.

Sinclair Oil Corp. is about to pick up another big plum in the industry-wide hunt for purchasable oil holdings. Southern Production Co., of Ft. Worth, this week agreed to sell its oil and gas properties to Sinclair for $107½-million.

Subject to approval by Southern's stockholders, Sinclair will get 37-million bbl. of oil reserves and about 1-trillion cu. ft. of gas reserves in the U. S.—plus 12-million bbl. of oil reserves in Canada. Southern Production's 12,500 b/d output (of which 5,000 b/d will be clear of terms of the purchase) will be welcomed with open arms by Sinclair—still crude-hungry despite its recent growing successes in exploration.

Southern Production's large reserves are a big attraction to Sinclair (which itself produces only 36% of its refinery runs of 430,000 b/d). And Sinclair is far from overlooking the value of a strengthened position in Canada.

In addition to the 12-million bbl. of Canadian reserves, the transaction would give Sinclair undeveloped leases north of the border, plus reservations and permits totaling 5-million gross acres. The company would take over a 40% stock ownership in Great Northern Oil Co., which has a new $25-million refinery near St. Paul, Minn., that processes more than 20,000 b/d of Canadian crude. Sinclair would get minority stock interest in several crude pipelines that connect the refinery with Southern Production's wells in Saskatchewan. And it would get an option to buy not less than 850,000 shares of Canadian Atlantic Oil Co., Ltd., at $4 a share. The stock has been selling at $8.

In both countries, Sinclair's liquid reserves, after deducting the estimated amount of the production payments, would jump by an estimated 21-million bbl., and its gas reserves by 525-billion cu. ft.

Under the "agreement in principle" reached this week, Sinclair would give Southern $42½-million in cash, plus a $65-million interest in production over a ten-year period. This would be about 7,500 b/d from U. S. oil and gas wells—mostly in Texas, Louisiana, Oklahoma, and Mississippi. Sinclair would probably resort to bank financing for part of the $42½-million cash. The $65-million production payment would not be an indebtedness or financial obligation of Sinclair.

According to Southern Production's board chairman, C. T. Chenery, his company would cease to exist, with the liquidating value of its stock between $43 and $45 a share.

The company's assets after the sale to Sinclair would be chiefly its two-thirds interest in The Offshore Co., which operates drilling barges off the Gulf Coast. These assets would be sold to Southern Natural Gas Co. for cash and stock.

Chenery points out that the deal is subject to the completion of financing arrangements, obtaining of tax rulings, and preparation of contracts, as well as to stockholder approval.

Three Gas Case Indictments

A federal grand jury this week returned a six-count indictment charging that Superior Oil Co. and two attorneys illegally sought to influence the U. S. Senate's vote on the Harris-Fulbright bill.

The measure, which would have eased federal regulation of gas producers, was vetoed by President Eisenhower on Feb. 17, with the explanation that investigation of "arrogant" lobbying activities in behalf of the bill had not been completed.

Eisenhower referred to the revelation by Sen. Francis Case (R., S. D.) that he had been offered a campaign contribution of $2,500. Although Case said at the time he was not necessarily implying that the contribution offer was a bribe, his disclosure led to a grand jury investigation and to lobby inquiries by two congressional committees.

Those indicted were Superior Oil Co., Elmer Patman, Austin attorney for Superior, and John E. Neff, Nebraska attorney employed by Superior.

The company and the two attorneys are charged in one count with conspiring to violate the lobbying act by collecting funds from Howard B. Keck of Superior and using the money to aid in passage of the bill, without registering as lobbyists. Maximum penalty upon conviction would be a fine of $10,000, imprisonment for five years, or both.

Patman and Neff also are accused of offering $2,500 to Sen. Case with intent "to influence the action, vote, and decision" of Case on the gas bill. (Case voted against the bill.) Penalty upon conviction on this count would be a maximum of $7,500 fine or three years imprisonment.

Neff is also accused of personally getting into contact with Sens. Roman L. Hruska (R., Neb.) and Carl T. Curtis (R., Neb.) in "an effort to persuade them to vote favorably for the passage" of the gas bill, without registering under the lobbying act, thus violating the lobbying law. And Patman is charged with "causing" Neff to contact the senators in violation of the lobbying act. Penalty upon conviction would be a maximum fine of $5,000 and imprisonment not exceeding one year.

The indictment says Patman collected a total of $7,500 from Keck or Superior Oil Co. for use against the gas bill.

In outlining the conspiracy count, the grand jury of the U. S. District Court for the District of Columbia set forth a list of "overt acts" to back up the indictment:

- That Patman received $3,000 from Howard B. Keck on May 23, 1955, $5,000 more from Keck on Nov. 9, 1955, and an additional $2,500 from Superior Oil Co. on Dec. 5, 1955.
- That on Oct. 28, 1955, Neff and Patman met and conferred in Washington. And that on the same date, Patman delivered $2,500 to Neff, together with a list containing the names of U. S. senators considered "favorably disposed toward the said bill, those who were considered unfavorably disposed . . . and those whose positions were unknown or doubtful."
- That Neff and Patman caused copies of a brochure entitled "Natural Gas Issue—Background," to be distributed to members of the Senate.
- That on Jan. 12, 1956, Patman delivered $5,000 in currency to Neff. And that on the same day, Neff visited the offices of Sens. Case, Hruska, and Curtis to discuss the natural gas bill.

Washington observers see some political implications in the indictments. Democrats have sought to make much of charges that the Eisenhower Administration has been favorable to big business. The gas-bill veto was widely interpreted as a masterstroke of

political strategy, particularly in view of the fact that its staunchest supporters in Congress had been Texas Democrats—House Speaker Sam Rayburn and Senate Majority Leader Lyndon Johnson.

With the Republican convention only three weeks away, the indictment will serve as useful Republican ammunition in gas-consuming areas.

A special committee headed by Sen. John McClellan (D., Ark.) is making a study to determine whether the lobbying law should be tightened. It has heard testimony from industry leaders who favored the gas bill, as well as spokesmen for organized labor and local gas companies that opposed it.

Legislation may be introduced next year as a result of the study.

What's New / IN THE INDUSTRY

Steel Strike Socks California Drilling

Drilling activity in California has dropped to its lowest level in five months because of the steel strike.

Only 63.5% of the 255 contract rigs in California are working—a drop of 2.5%, or 7 rigs, in the past week alone. A total of 93 rigs are idle, the highest since February, when 102 were not working. Each rig means an average of 20 oil workers without jobs.

The steel strike also is spurring abandonment of old wells which had been producing only a trickle of oil, or none at all. A Bakersfield contractor who specializes in abandonment wells reports he is swamped with business.

Some smaller operators reportedly are paying bonuses for casing. Highest bonus reported in the first week of the strike was 25¢ per ft. By the third week, one bonus of 50¢ per ft. had been reported.

•

Look Out for Thieves

Thefts of oil field equipment due to shortages brought on by the steel strike are a definite threat, according to the Texas Mid-Continent Oil & Gas Assn.

George Robey, the association's chief special investigator, sent a bulletin to law enforcement officers alerting them to the danger of such thefts.

"The operators are having enough trouble keeping their drilling programs under way under present conditions," Robey said. "Theft of such irreplaceable material as pipe cause losses far in excess of the value of the equipment itself."

•

A Texas Supreme Court ruling in a case involving coastal oil lands will have a "far-reaching" adverse effect on state ownership of such lands, according to Land Commissioner Earl Rudder.

The court ruled against the state last week in a case involving 572 acres on Copany Bay. The suit was brought by Russell S. Ponder, Sun Oil Co., and others. The state had contended it owns everything that is submerged by Gulf tidewater—a point 1.1 ft. above sea level. Ponder said the correct level is 0.4 ft., and the court agreed.

Rudder said a check of one county alone showed 25 mi. to 30 mi. of coastline will be affected by the decision. He added the check "reveals that unquestionably the Permanent Free School Fund of Texas stands to lose literally thousands of acres and untold revenues." He said he will seek a rehearing of the case.

In another case involving the petroleum industry, the court held that natural gas companies in the state were entitled to a $6-million tax refund. In a suit brought by Tennessee Gas Transmission Co., the court ruled the refund was due to those companies that had paid taxes without protest under an invalid 1951 law.

•

Majority production from another Texas gas field will be withheld from interstate sale because of a new purchase by Texas Gas Corp.

Texas Gas contracted to buy Stanolind Oil & Gas Co.'s gas production from the new Marrs McLean field in Jefferson County. The 20-year contract, signed last week, was made on the basis of the gas being sold intrastate.

•

A 10% fee on the proposed sale of Universal Oil Products Co. stock has been termed "excessive" by a New York state official.

The commission is sought by Guaranty Trust Co., of New York, co-trustee of the petroleum research fund, which holds the stock. Jacob Javits, the state's Attorney General, said state law calls for a 5% commission on sales of stock owned by charitable trusts.

•

California's proposed oil conservation act is being threatened by another court suit.

Charles L. Smith, a Los Angeles oil broker, contends the proposed measure—which will appear on the state ballot Nov. 6 as an initiative—violates the state constitution. Smith claims an amendment to the state constitution prohibits naming of individuals to state posts in initiate measures. He says the proposal violates this provision by virtually naming two members of three-man control commission set up under the act.

R. W. Ragland, vice-president of Richfield Oil Corp. and a leading proponent of the measure, described the suit as "ludicrous" and called it a "desperate eleventh-hour attempt by the anti-conservationists."

The measure, which is supported by all of California's integrated major companies except Union Oil, would provide for unit operation of California's pools if the owners of 75% of the land area of the pools agree.

•

Manitoba's increasing oil output soon will be sufficient to cover the expanding needs of the province, according to M. S. Beringer, president of British-American Oil Co.

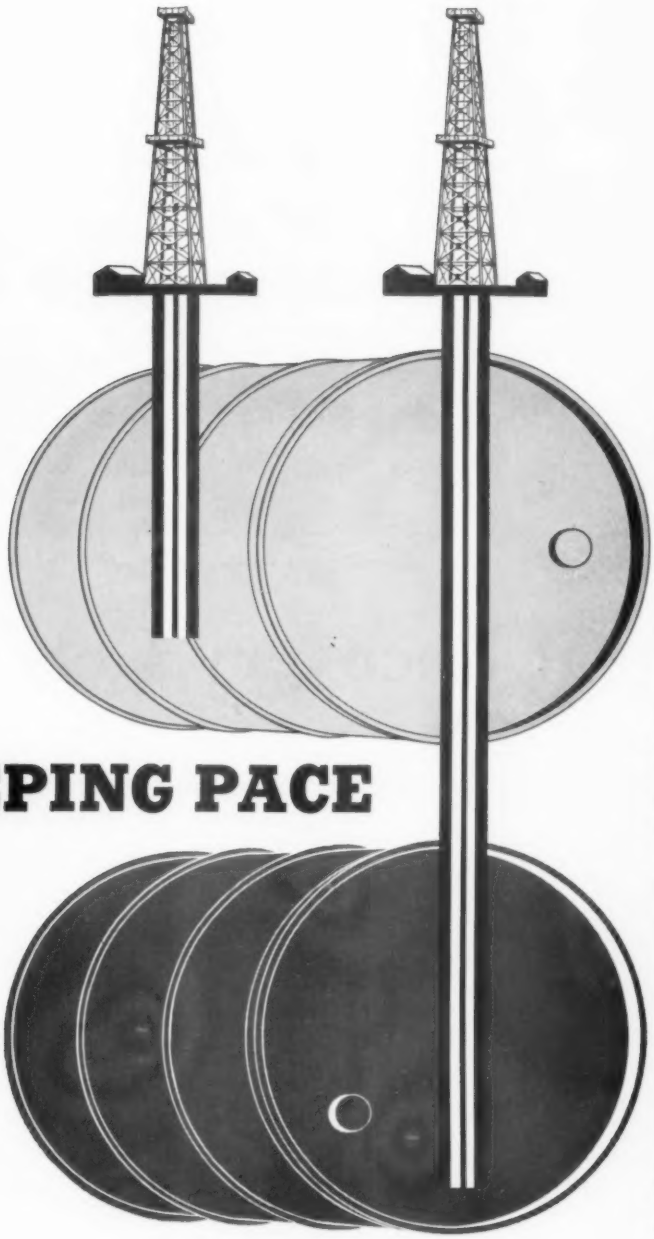
Beringer said Manitoba had nearly doubled crude production, to more than 4-million bbl., last year. He added that successful drilling was bringing a steadily increasing rate of production.

•

Supply of oil country tubular goods will be boosted by about 100,000 lb. annually next year when Lone Star Steel Co. completes a $6-million expansion of its Longview (Tex.) plant.

Included in the expansion program is a new open hearth furnace, which will boost Lone Star Steel's ingot capacity by 25% and a stretch-reducing mill. The mill scheduled to be finished by Apr. 15, will enable the company to use 5½-in. casing to turn out 2½-in. tubing. The furnace is expected to be producing steel within a year.

The Lone Star Steel announcement is the third in recent weeks concerning additional steel facilities in Texas (PW—Jul20'56,p12).



KEEPING PACE

Drills were chewing their way down for about 2000 feet in the search for oil in 1916. Today's drilling depth is more than double that.

The change in drilling that forty years has brought well symbolizes many advances in the petroleum and chemical industries. Engineers have dug more deeply into the secrets of nature, too . . . have designed plants and processes to wrest new products and services from petroleum, ores and elements.

We mentioned 1916 because that is the year Sun Ship was founded. It has long served the swift-growing needs of petroleum and chemical industries. Year by year, the engineering skill and facilities of the great Sun Ship plant have proven their ability to meet the demands for plant and equipment keyed to the swift pace of progress in these and other important fields. Sun Ship keeps pace with progress.

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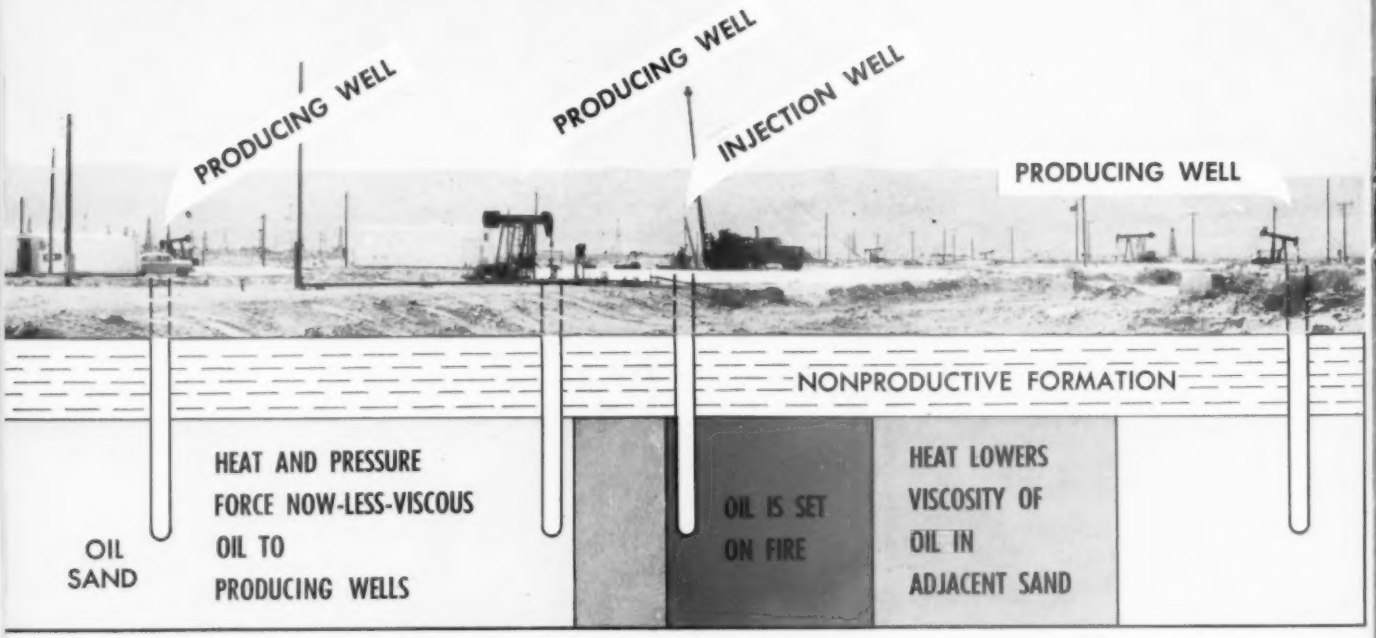


MIDWAY-SUNSET FIELD, near Maricopa, is the site of Standard of California's million-dollar experiment. This is where . . .

Thermal Recovery Gets a Payoff

A significant, deep test of thermal recovery (underground or "in situ" combustion) is under way in the Midway-Sunset field near Maricopa, Calif.

Oil-bearing sands just below the 2,000-ft. level were ignited July 12 by Standard Oil Co. of California scientists. An electrically operated igniter energized a heating coil at the bottom of the injection well. In about three minutes, a temperature rise, indicated by a thermistor at the bottom of the hole, told the scientists that the underground fire had been successfully started. (The thermistor is a relatively small, rugged instrument, which serves as a temperature-measuring device.)

More than a year of preparatory work went into the test, which is being conducted by California Research Corp., a Standard of California subsidiary.

Factors in the selection of the sand were its depth, permeability, porosity, and gravity, and the viscosity of the oil it contains. Another important factor was location of the sand beneath fee property—this will afford tighter control of the experiment.

Work involved drilling the injection well, No. 109-C on section 5-11n-23w, and three producing wells, Nos. 109-O, 109-A, and 109-B, encircling the injection well at distances of about 200 ft. from the well head.

The injection well was drilled in the same way as any routine development well, except for careful coring of the sand to be ignited.

The producing wells were completed on the pump for an average of 2 to 3 b/d production.

Special metering, gauging, and sampling facilities are installed to observe the performance of the test, the production increases of the wells, and changes in composition of the hydrocarbon system as combustion (at about 1000F) proceeds.

A 600-hp. air compressor provides more capacity than the trial is expected to require. In addition, standby compressors are used for gas supply in the initial stages of the project.

The heat front resulting from ignition of the oil sand will be forced outward toward the producing wells to boil out previously unrecovered crude oil.

Initially, both gas and air were forced into the injection well to insure combustion of the oil sand. Injection was through a control manifold, which regulates air to the casing and air and gas to the burner. The gas was expected to be cut off when combustion took a firm hold in the underground sand.

The injection well and three producing wells are ringed with older producing wells in the same zone. These wells will be used as observation wells. Other observation wells will be drilled near the injection well. The temperature of the combustion front will be followed by temperature gauges installed in these new observation wells.

Research personnel will keep the fire burning and provide around-the-clock supervision of the project, which is expected to take a year to complete.

California Research officials believe five or six men will be able to handle the 24-hour watch at the field site. Three "doghouses"—a tool room, an instrument house, and a change room with office space—have been set up to accommodate personnel and a portion of the equipment. The doghouses are air-conditioned.

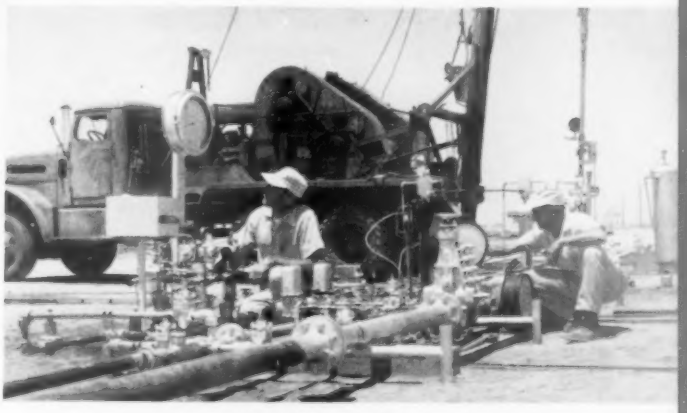
Any danger of the fire flaring out of the injection well is met by the thermistor, which will sound an alarm in the instrument house if the heat begins to get out of hand. By regulating the compressed air going to the combustion front, personnel will be able to keep the situation under control.

The fire can be stopped simply by cutting off the air supply; it can be restarted just as simply by a renewed air supply.

Once started, such fires build up a heat back-log of 800F to 1200F in

JOHN H. THACHER, JR., vice-president of California Research Corp., ignites the oil sands, 2,000 ft. below.

A 600-HP. AIR COMPRESSOR, and smaller units for gas supply, provide power for the big project.



CONTROL MANIFOLD is adjusted to regulate flow of gas and air.

Test in California

the burned-out sand. But the heat needed for combustion is only about 400F. A very low rate of heat-transfer in the sand accounts for the heat back-log.

From a conservation standpoint, no usable oil is expended in the thermal recovery process. The usable oils are pushed ahead of the burning front after their viscosities have been changed. Only the heavy residual of the oil actually is burned.

When the test is over, researchers hope they will have an answer to the big question: Is in-situ combustion economically sound as a method of secondary recovery?

Laboratory tests of thermal recovery date back more than eight years. A pilot test was conducted in a South Oklahoma field in 1952. Other tests in that state followed, with similar studies also made in Kansas and Pennsylvania.

Both tests showed that porous Pennsylvanian sands could be swept clean of low-gravity oils which had defied various recovery attempts for as long as 40 years.

But California, with its heavy crudes, is the current focal point of petroleum industry interest. General Petroleum Corp. is conducting an in situ combustion experiment in a shallow zone (about 700 ft.) at the Belridge field in Kern County (PW—Jul.29'55,p21). Work on the $1-million test began last year and will take possibly another two years to complete.

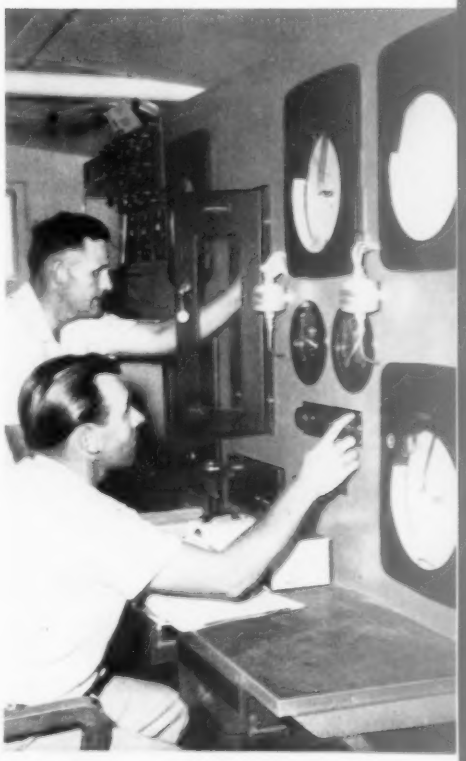
A five-well pattern (one injection well and four production wells) is being used in the Belridge test, which is being conducted as close to laboratory conditions as possible.

The GP test has the backing of 11 other oil companies, indicating the deep industry interest in the subject.

California Research scientists are confident thermal recovery will work, on the scale being attempted at Maricopa. The methods used were developed at the La Habra laboratories and tested successfully by California Research and The California Co., another Standard of California subsidiary, in the Irvine-Furnace field in Kentucky.

But, like GP in South Belridge, and Sinclair Oil Corp. in a Kansas test, Standard of California is primarily concerned with the economics of thermal recovery.

The company doesn't intend to rely on any one individual, or group of individuals, for computation of data obtained from the test. Instead, the data will be fed to an electronic computer, to resolve the complicated variables in an effort to learn if thermal recovery out-performs water and gas injection.



INSTRUMENT HOUSE is the operational nerve center of the pilot field-test. From it, observers can tell pretty well just what's going on underground.

What's New / IN EXPLORATION, DRILLING, PRODUCTION

Texas Continues 16-Day Schedule for August

The Texas Railroad Commission is continuing the 16-day producing schedule for the state through August. But the New Mexico allowable has been increased 1 b/d per well.

Louisiana also raised its allowable to take care of new production. The increase was 8,024 b/d to total 746,829 b/d.

The Texas schedule showed 3,384,744 b/d allowable on July 14, but will increase about 40,000 b/d because of new wells.

The 16-day schedule was continued despite recommendations from most purchasers for a reduced flow. Commissioner Ernest O. Thompson noted that stocks of Texas-origin crude have declined an average of 100,000 b/d in the past 30 days and now stand 6-million bbl. under the year-ago level.

Cities Service Oil Co.'s tentative "nominations" to buy Texas crude, made before settlement of its East Chicago refinery strike, would require less than 11 days flow, the commission was told. Two other companies recommended a 13-day pattern; one favored 14 days; four favored 15, and three—Humble, Sun, and Texaco—favored the 16-day basis which the commission adopted.

New Mexico's allowable was increased from 38 to 39 b/d per well for each unit.

•

Utah Claims Land Rights

Utah is claiming mineral rights on 101,610 acres of federally owned lands within the state's borders. Principal concern is oil, gas, and uranium.

A Utah state board member says that land-swap agreements reached between the state and federal government on this acreage are void. The reason: A state law, passed in 1919, prohibits transfer of mineral rights on survey school sections.

Part of the acreage (seven sections) is located near the big Aneth pool, on Navajo tribal lands in San Juan County. The Navajos already have granted leases on their lands. And now the state is granting oil and gas leases on the disputed sections.

Some talks on the problem have already been held in Washington with officials of the Interior Dept.

•

Northwest Production Co., English Oil Co., and Panhandle Oil Corp. are joining in a search for natural gas in western Colorado.

Northwest, exploration affiliate of Pacific Northwest Pipe Line Corp., will drill a 7,500-ft. test on the English-Panhandle 32,000-acre Urado unit in Rio Blanco County. A two-well program also is scheduled on English-Panhandle's 36,000-acre Coyote Basin prospect in the same county.

•

Oklahoma's Corporation Commission is exempting Anderson-Prichard Oil Corp. from full compliance with its must-buy allowable order for July.

Anderson-Prichard, buying 80% of allowable in the Cement pool in Caddo County, is the first company to apply for relief from the decree. The application was granted without opposition from any independents.

No other company has filed for relief from the order. But Gulf Oil Corp. had asked a federal court for an injunction permitting purchaser proration (PW—Jul.13'56,p12).

•

The Texas Railroad Commission has issued a memorandum clarifying an earlier order concerning discovery allowables.

The new order will require engineering proof that the discovery well actually taps a new reservoir, rather than extending another field.

Applications for new discoveries must list all nearby fields and producing formations, and the average depth of the producing intervals. Total depth must be shown on all dry holes that are used as evidence of separation from nearby fields.

•

Louisiana's Mineral Board accepted bids on more than $11-million worth of state leases last week. The top bid—$3,504,250—came from a three-

Offshore Rig Has Diesel Electric Power

The first platform-and-tender type drilling device to use diesel electric power has been put into service on the Gulf Coast by Kerr-McGee Oil Industries, Inc.

The drilling unit—Rig 48—is now on location on State Lease 1072 A-1 in the West Delta Area, off Plaquemines Parish, La. It is working for the CATC group (Continental - Atlantic - Tidewater - Cities Service).

Power is supplied by three 875-hp. engines, each driving two 500-kw. d.c. generators. Electric power is transformed back into mechanical power by eight 625-hp. electric motors. Two engines are located on the tender, the other on the platform.

company combine for 1,070 acres in Bastian Bay.

The three companies—Stanolind Oil & Gas Co., Tidewater Oil Co., and Gulf Refining Co.—paid a total of $8,443,325 for five leases covering 4,840 acres in that area. The board accepted bids on a total 29,310 acres.

•

Construction is under way on a $7-million mobile drilling barge which will be under contract to The California Co.

The barge is being constructed at Avondale Marine Ways, Inc., at New Orleans, for Noble Barge Co.

Calco will use the mobile barge, which can drill in 45 to 100 ft. of water, "somewhere in the Gulf" after completion, expected in about a year.

•

Drilling Highlights

West Texas—Two exploratory wells on opposite sides of the Permian Basin show promise of extending oil production. On the south, in Concho County, a well being drilled by Ray Smith Drilling Co., Tucker Drilling Co., San Angelo, and others, has flowed oil and gas from relatively shallow Strawn and Canyon formations. The well flowed gas at the rate of 12,160,000 cu. ft. per day on drillstem test at 4,339-56 ft. Another test at 4,356-71 ft. flowed gas and oil at a rate of about 10 bbl. hourly.

The second well is located about 200 mi. northwest, in Winkler County. Shell Oil Co. has found gas-

Dump Well Looks Good

The city of Houston apparently will have a producing oil well on its municipal dump (PW—Apr.13'56,p12).

Trice Production Co. has drilled to a total depth of 11,050 ft., its announced objective, on the flank of the old Pierce Junction salt dome field, after finding good shows around 8,000 ft. and again at 10,630 ft.

The deeper show is in the Yegua sand, a new prospective pay for the field. It's expected to touch off a new drilling play in the old field, which has had somewhat of a drilling revival during the past year.

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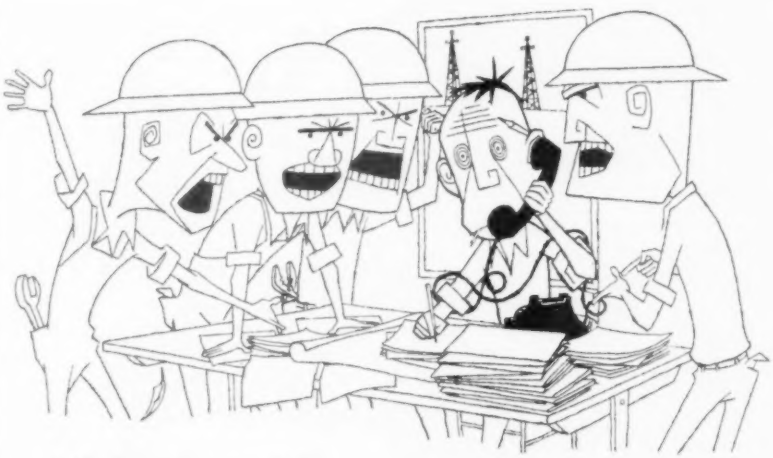

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distillate pay at the 13,500-ft. level of the Pennsylvanian formation in the Delaware Basin (PW—May4'56,p14). Shell's No. 1 University 17-A flowed gas at the estimated daily rate of 1,560,000 cu. ft. on drillstem test at 14,036-110 ft. The wildcat also flowed 37 bbl. of 52-gravity distillate in 3¼ hours.

Illinois—Cities Service Oil Co. is locating the No. 1 Nolan in section 10-12n-4w, Christian County, to test the Devonian at a depth of 2,000 ft. The test location is about 3½ mi. west of Morrisonville and 5½ mi. southwest of the Kincaid pool, nearest production.

Montana—Gulf Oil Corp. has tested shows in the Upper Mississippian at a wildcat in the Disturbed Belt in Teton County. The well is No. 1 Teton-Knowlton, section 8-26n-8w. Gulf topped Sun River dolomite at 5,527 ft. and found stain and fluorescence in cores at 5,530-60 ft. and 5,561-95 ft. Drillstem test at 5,500-60 ft. recovered 3,550 ft. of gas and 350 ft. of heavily gas-cut mud with a rainbow of oil. Though the shows are slight, they are of more than passing interest because the area has commanded high bonus bids on land offered for sale by the Blackfeet Indians. The area has been under intensive geophysical exploration by several companies.

Utah—The Texas Co. has completed a discovery 3 mi. northwest of Aneth field, San Juan County, for an oil flow of 436 b/d. The company originally classified the well 2 Navajo-G, in section 18-40s-24e, as an extension to Aneth, but now has reclassified it as a discovery. Production is from the Paradox (Pennsylvanian) at 5,497-537 ft.

Oklahoma—Lone Star Producing Co. has added a third discovery zone to the Northeast Moore pool, Cleveland County. The No. 2 Miller, in section 13-10n-3w, ran drillstem test in the Red Fork (Pennsylvanian sand) at 7,314-32 ft. with tool open ten minutes. Gas showed in two minutes at an estimated 4½-million cu. ft. daily, with recovery of 30 ft. of distillate. In the same area, An-Son Petroleum has fracture-treated Boise d'Arc lime perforations (Devonian) at No. 1 Hoover, in section 21-10n-3w, discovery well northeast of the West Moore field (now linked with the Short Junction trend) and southwest of the expanding Lone Star area. The 7,892-919-ft. zone flowed load and 132 bbl. of new oil in 18 hours through various choke openings.

The oil industry will have to find the equivalent of an East Texas oil field every 15 months in order to supply the demand during the next 25 years! We at Lone Star Steel know our obligation to our friend Joe Roughneck . . . symbolic spirit of the oil industry . . . the man who must drill for and deliver this fabulous amount of oil. We pledge to continue working day and night . . . to supply the *API quality casing, tubing* and *line pipe* Joe needs.

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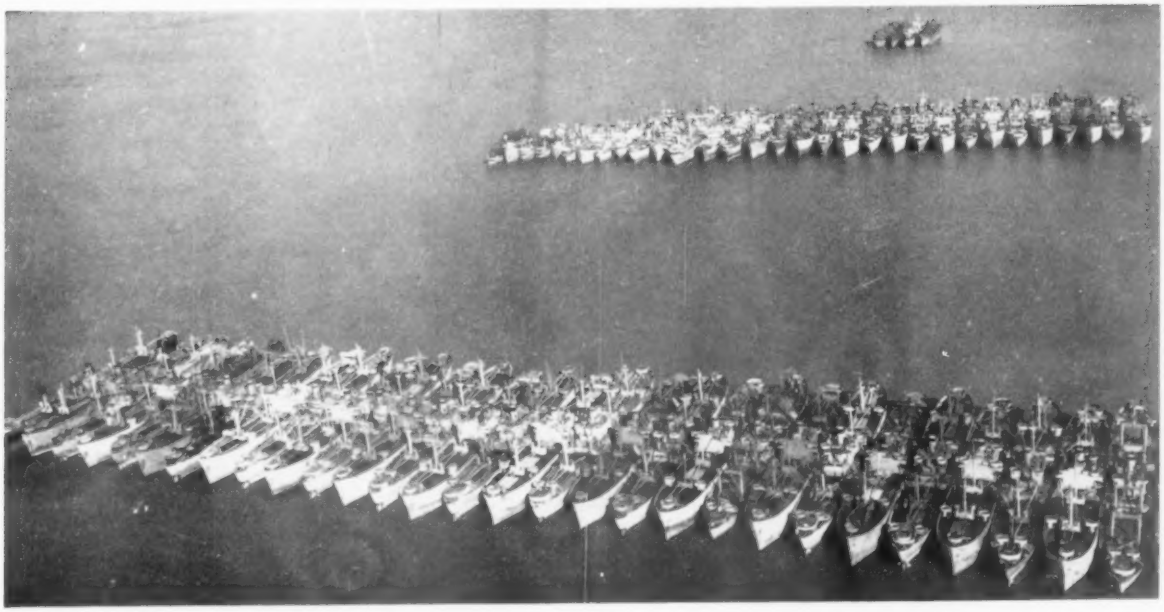


MOTHBALLED U.S. VESSELS are attracting increasing interest. High rates being charged for private bottoms are key to . . .

Why Oil Men Eye Reserve Fleet

Private firms are trying to pry at least 80 ships from U.S. "boneyards," including 20 tankers. For oil men, the move has mixed meanings.

Oil men are watching the U.S. mothball fleet for signs of what may happen to tanker charter rates.

Tanker rates affect the whole oil industry. And right now they're high —roughly 65% higher than they were at this time last year.

Part of the reason for this upward climb has been a steady surge in shipping all over the world.

New ships, meanwhile, have not been coming off the ways fast enough to take up the new business. So the price for existing tonnage has gone up.

Oil became affected when tankers started slipping out of oil service to cash in on grain- and coal-hauling opportunities. (There are some 75 tankers in nonpetroleum trade today.)

With the market for all ship space running at the highest level since Korea—and with an outlook for continued high rates in the next few years—shippers have been turning to the only source in the world of operable, unused vessels.

The government has about 1,000 ships of all types now in mothballs at various locations, of which 18 are ocean-going tankers. Build-up of this reserve fleet started shortly after World War II, and it reached its peak in 1950, when 2,277 vessels were in mothballs.

The Ship Sales Act of 1946, with 1950 amendments, has resulted in sale of some 2,000 U.S. vessels, many sold before they reached the "boneyards" (lay-up locations). The sales included 481 tankers. And until a year or so ago, there were no ocean-going tankers in mothballs. Then the Navy turned in 21, and the government's "trade-in-and-build" program added 14.

Recently, the Military Sea Transportation Service received permission to withdraw 17 of these tankers. And Pan-Atlantic Steamship Co. has asked for 20, to convert them to combined carriers of oil and dry-cargo deck containers.

The MSTS action and the Pan-Atlantic plan alone have stirred up interest in oil circles. But oil men have been watching the applications for dry-cargo vessels as well.

The way some oil men figure it, every old tanker or freighter that's added to existing tonnage could conceivably ease the pinch on tanker rates.

They figure that, with 14 dry-cargo carriers already slated to come out of mothballs, and another 60 under consideration for release (table, page 20), tanker operators will have that much less incentive to stray over to dry-cargo charters.

And with the number of other freighters still remaining for possible charter, they feel, tankers now hauling grain and coal could be chased back into their own business.

Others debate the point, saying that release of freighters might put more pressure than ever on tanker rates.

Most vessels released or to be released from the reserve fleet will be under charter deals, which means the operator will have only a few years at most to recoup his investment. It costs about $150,000 just to demothball a vessel, then remothball it when the operator is through with it. Then there are the charter fees, and costs of putting some of the more decrepit freighters into suitable working condition.

These factors, say the skeptics, will cause operators of reserve-fleet vessels to stick as close as possible to going rates. And no tankers will be outbid

for dry-cargo charters and eased back into oil-hauling.

Another aspect of reserve fleet activity that's stirring oil men is the fact that so many laid-up vessels are being sought for a competing industry—coal.

The most controversial application is that of American Coal Shipping, Inc. (table). This firm is the offspring of a new alliance between mine operators, coal-carrying railroads, and the United Mine Workers Union.

The U.S. coal industry has perked up recently over prospects of new export markets, particularly in Europe. But a big drawback to its long-range competition abroad is transportation cost. So the coal-rail-UMW alliance wants to do its own shipping, st rting with reserve-fleet vessels.

Some international oil companies don't relish the prospect of coal getting a helping hand abroad, with U.S. assistance. Others figure the coal is aimed at industrial markets not open to oil anyway—and that U.S. coal operators may as well nail down the business.

And one oil man points out that, if the coal industry gets prosperous enough on exports, its leaders "won't be in Washington so often trying to kick us around."

So far, the government has shown reluctance to disturb the private rate structure with reserve-fleet vessels.

The Maritime Administration turned down an application by the International Cooperation Administration and the Dept. of Agriculture for 30 vessels. These agencies were told to scrounge around a little harder for private bottoms.

And Congress has been pawing over terms of the bill that would lease tankers to Pan-Atlantic, lest the company gain an undue "windfall" over competing carriers. (Maritime handles charter applications, including requests for tankers by other government agencies; Congress must pass on all other tanker charters and on all sales from the reserve fleet.)

The line between tankers and other vessels, meanwhile, remains flexible. Maritime has just authorized Mystic Steamship Co., of Boston, to transfer one of its colliers to a Liberian affiliate, on condition that the tonnage be replaced. Mystic's application says it will convert a T-2 tanker to coal-hauling.

Recent Applications for Laid-Up Vessels

(No approved ships in service yet)

APPLICANT	VESSELS	PURPOSE	STATUS OF REQUEST
Maritime Administration Proceedings			
Military Sea Transportation Service	17 T-2 type tankers	Military oil supply	Approved
Isbrandtsen Co.	6 Liberties	Coal to France	Approved
Lykes Brothers	5 Victories	Eur. & Med. trade	Approved
Pope & Talbot	2 Victories	Intercoastal	Approved
Gulf & South American Steamship Co.	1 Victory	U. S. Gulf to South America	Approved
American Coal Shipping, Inc.	30 Liberties	Coal to Europe, other return cargo	Hearings start July 30
Pacific Far East	2 Victories	Wheat to Pakistan	Hearings started
Grace Line, Inc.	2 Victories	S. American trade	Hearings pending
Int'l Co-op. Admin. & Dept. of Agricul.	30 Liberties	Foreign aid cargoes	Disapproved (May be reopened)
Congressional Proceedings			
Pan-Atlantic Steamship Co.	20 tankers	Intercoastal oil/dry cargo	Passed by House, now before Sen.
Browning Lines, Inc.	2 C-4 ships	U. S. Atlantic, Cuba & Mexico	Before House
American-German Coal Transport Co.	24 Liberties	Coal to Europe	Introduced

What's New
IN TRANSPORTATION

Trans-Canada Pipe Lines, Ltd., may not be able to keep its construction agreement with the Canadian government because of the U.S. steel strike.

The company said last week it is "concerned" about getting the 34-in. pipe it has under option in the U.S. The company must complete the first leg of its cross-country gas line (as far as Winnipeg) by Dec. 31, and repay an $80-million loan from the Canadian government by next Apr. 2, or forfeit the line to the government. Construction started last month (PW—Jun.15'56,p47).

A clause in the agreement, however, eliminates penalties if the company defaults for causes over which it has no control.

•

Pacific Northwest Pipeline Corp. reportedly plans a lateral to California, along a route previously planned by El Paso Natural Gas Co.

El Paso applied to the Federal Power Commission last year for permission to tap Pacific Northwest's trunk near Mountain Home, Idaho, to supply Pacific Gas & Electric Co., San Francisco. But El Paso later arranged to increase its supply to PG&E via expanded line facilities farther south. Now Pacific Northwest is said to be ready to apply for permission to pipe gas to California itself.

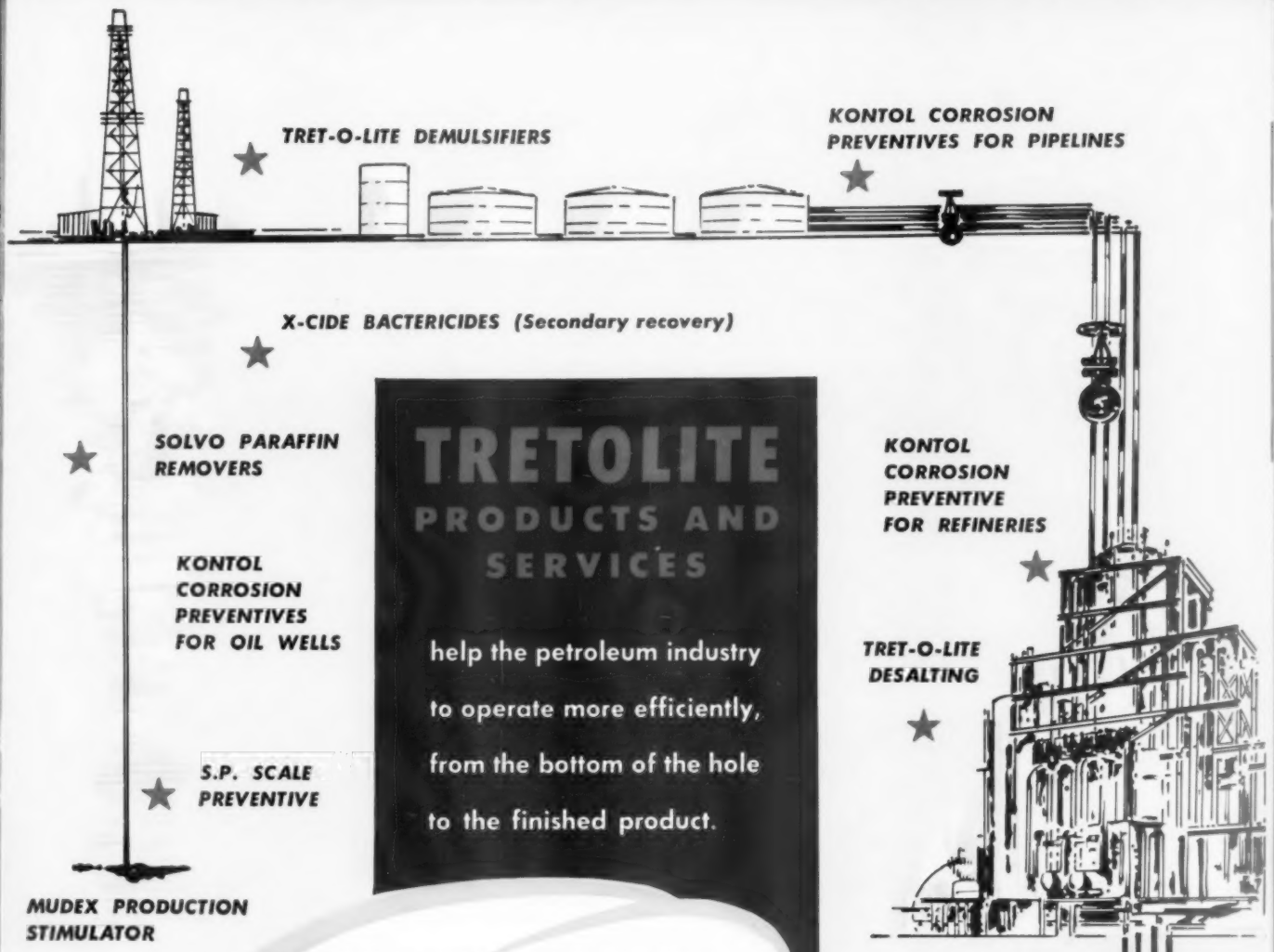
•

Orders for economy-size tankers are continuing in Europe. Aristotle S. Onassis, Greek shipowner, announced last week he has ordered two 65,000-ton tankers to be built at the Howaldtswerke shipyard in Kiel, Germany. Delivery of the 17-knot vessels is expected in 1960.

Another Greek shipowner, George Petrianides, ordered two 45,000-tonners in the Deutsche Werft yard, Hamburg, two 40,000-tonners and a 21,800-tonner in the Howaldtswerke yard. Delivery is also scheduled for 1960.

•

Refinery docking facilities at the east end of Montreal harbor are being deepened to 35 ft., to accommodate bigger tankers. Post Manager Guy Beaudet told PETROLEUM WEEK that dredging should be completed at the end of August. The docks serve McColl-Frontenac, Shell, Petrofina, and Joseph Elie, a fuel oil distributor.



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THE SHORTAGE OF SCIENTISTS AND ENGINEERS:

A Threat to Economic Progress

THERE are two paramount reasons for concern over the serious shortage of scientists and engineers that now confronts the United States:

- The first reason, with which this editorial deals, is that continued expansion of our economy and further increases in our living standards are threatened unless we train more scientists and engineers and use them more effectively.
- The second reason for concern is that we run the risk of falling behind the Soviet Union in the technology so essential to national security. The consequences of losing this race to the Russians are not comforting. (The possibility that this might happen over the next few years was discussed in an earlier editorial in this series.)

The crucial contribution of scientists and engineers to the well-being of the American people has been to find ways of making better use of limited resources, to make equipment more productive, to develop new and better products that enrich our lives, to enable us to live longer and be healthier. They have made this contribution with greater success in the last 15 years than ever before, but it has required progressively more resources and more trained people.

During this 15-year period our annual production of goods and services, in dollars of constant purchasing power, has almost doubled. Since our total population has increased only 25 percent, this has meant a tremendous rise in the economic well-being of the American people as a whole. But in accomplishing this, the number of scientists and engineers has been more than doubled.

Tasks for Research

If the American economy is to continue to grow and if our living standards are to show further improvement, the work of scientists and engineers must be stepped up even more in the years ahead. Unless answers to several pressing problems are found through intensified research efforts, economic progress will become increasingly more difficult.

Productivity per hour of labor must be increased at a faster rate. Improved medical care has greatly increased the number of people who attain retirement age, and sharply higher birth rates since the war will mean larger numbers of children in school and college. Meantime, because of low birth rates during the depression, the number of people reaching working age is not rising nearly so fast. The result is that over the next 20 years our population will increase by about one-third, while the total manhours worked are not expected to increase more than 15 percent. So, simply to maintain the same living standards for a rising population — with no provision for additional improvements — ways must be found to enable each worker to produce for more dependents.

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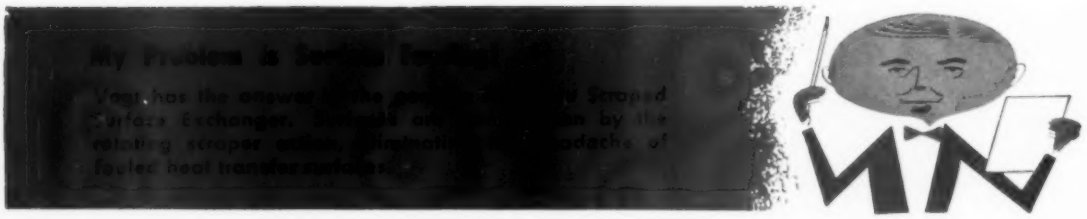
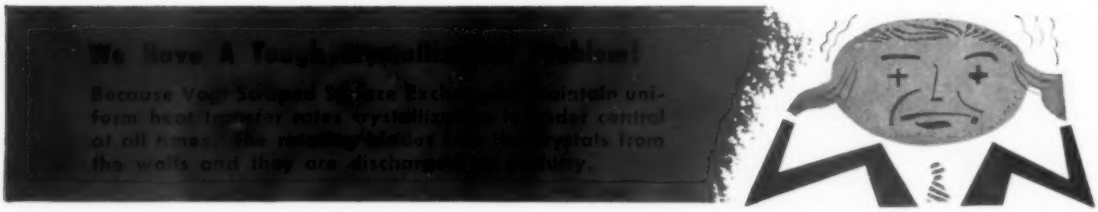
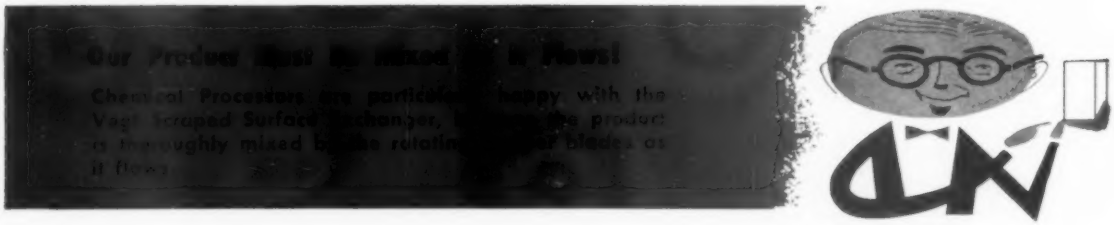
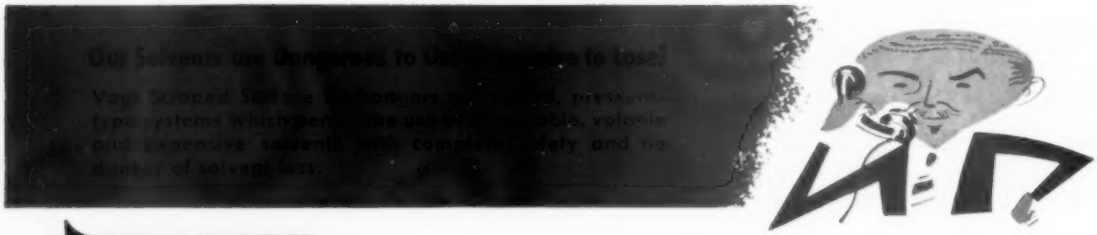
Have You a Special Heat Transfer or Chiller Problem?









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resources. We will need to make more effective use of our existing fuel supplies — coal, oil and natural gas. And we will have to devise economically practical means of tapping other energy sources, particularly nuclear power and new rocket fuels.

Also, better ways must be found to use scarce and low-grade raw materials. Thanks to great strides in metallurgy and mining techniques, we are now utilizing sources of copper and iron ore that, for all practical purposes, were not available to us only ten years ago. Similar strides are needed in the mining and processing of bauxite if low-grade domestic ores are to help satisfy a fast-growing market for aluminum. And stubborn technical obstacles in the area of "high temperature" metals—such as nickel, cobalt, columbium, tantalum and titanium — are impeding progress in jet and turbine engines.

These are only a few of the challenging tasks that demand intensified research and engineering activity in the years immediately ahead if the United States is to continue to raise living standards. We need more houses, schools and highways for a rising population, more medical research to reduce further the ravages of illness, more research in chemistry and other sciences to sustain the flow of new and improved products that are so essential an ingredient of our economic progress.

Ceiling on Growth

American industry has indicated that it is ready to meet the challenge and undertake vastly expanded research programs. A recent survey conducted by the McGraw-Hill Department of Economics revealed that total research and development expenditures of American industry were almost $5 billion last year, 29% higher than in 1953. By 1959 business plans to be spending well over $6 billion on research and development. And the total could well prove to be much higher, based on the trend of recent years.

But industry's programs for research and development cannot be carried out unless enough qualified research workers and engineers are available. Ernest R. Breech, chairman of the Ford Motor Company, recently described the supply of engineers as the "ceiling on our future growth." He gave force to his point by announcing: "If 900 qualified engineers were to approach us next week looking for jobs, we would hire every one." The U. S. Bureau of Labor Statistics found in interviews with some 200 large companies at the end of 1954 — a recession year — that at least half were unable to hire enough research scientists and engineers to meet their needs. A third of the companies reported substantial shortages of technical personnel.

The shortage of technically trained people, furthermore, is becoming more acute. The number of engineers and scientists now being graduated is only about enough to cover replacement requirements, while the needs of industry, government and education are mounting every year. According to the best information available — as indicated in the first editorial in this series — these needs are now about twice as great as our current engineering graduating classes and annual production of scientists with Ph. D. degrees.

To perform the research needed to remove roadblocks to our economic progress — and at the same time hold our own in the technology essential to our security as a free nation — we must have an adequate supply of men and women with engineering and scientific training. Instead, we are faced with an acute shortage, now and for several years to come. Reasons for the shortage and proposals for working our way out of the shortage will be discussed in the remaining two editorials in this series.

This is one of a series of editorials prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments of particular concern to the business and professional community served by our industrial and technical publications.

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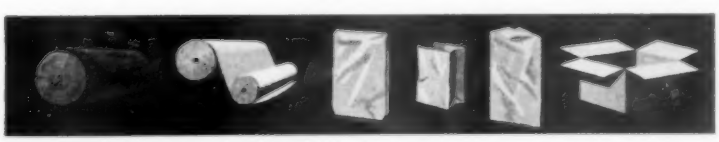

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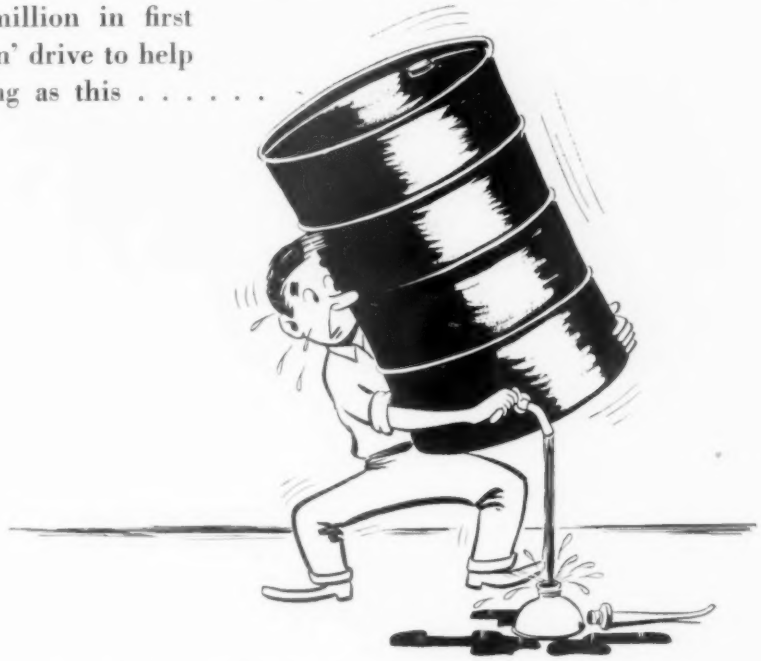


Work smarter—not harder. That's the appeal being made by Esso Research & Engineering Co. to all 2,500 employees, from the messenger to the president. It's the core of the company's new work-simplification program, started last year as the result of a top-to-bottom operations analysis. Direct savings so far: well over $1-million.

This week a new centralized mail system became a demonstrated success at the Esso Research Center, in Linden, N. J. This is a mail-cart method that trims average delivery time between scattered buildings and departments from more than a day to a couple of hours. It's one of the big payouts in a program that so far has stressed work simplification for non-professional employees.

Now the company is turning to the "tremendous possibilities" inherent in bringing its engineers and scientists into the formal program. Says Vice-President A. P. Hewlett (who is vice-chairman of the top-level operations analysis committee): "There's a lot of gold in those hills."

I. Industry Pace-Setter

The company is shooting for companywide application of formal work simplification. This system uses scientific methods to find the best way to do a job. The system gets into such special techniques as flow-process charts, records management, work-distribution studies, and man-machine analyses. But Hewlett points out that the basic principle is simple: "Putting order into the way we do things."

Actually, what Esso Research is doing is to intensify on a formal basis the efficiency studies it has made all along. Many oil companies are using some form of operations analysis to keep costs in line. But Esso Research is going further than most.

Also active in work simplification are the company's affiliated laboratories at Baton Rouge, La. These, and Esso Research itself, initially drew on the experience of the controller's department of Esso Standard Oil Co., which has been in work simplification for years.

The system is in growing use outside the oil industry, with a good toehold in the steel industry. It is being emphasized by such companies as Lipton Tea and Ford of Canada. And it is getting close attention from the armed services.

In the past ten years, about 200 U. S. firms of all kinds have sent men to New York University for training in the system. These men have attended the Work Simplification Roundtables held every six months since 1947 by NYU professors W. R. Mullee and D. B. Porter.

The only other comprehensive training available is at the Work Simplification Conferences held at Lake Placid, N. Y., by Allen Mogensen. He originated the formal technique in 1937.

In both places, men are trained to set up programs back at their companies.

Small oil companies are at a disadvantage in starting their own programs, the specialists say, chiefly because they normally would lack the necessary staff guidance. Esso Research men say the principles of work simplification apply equally to big or small companies. But they stress that a smaller company would have to jump in with both feet, with adequate staff assistance.

Prof. Mullee agrees. He says, "The job would be hard for the average small oil company, unless trade associations took the initiative in providing training. But the laundry industry has shown that this is possible."

Both Mullee and Esso Research officials also observe that the individual oil man has much to gain by studying work simplification on his own.

II. Goal: More for Money

The main reason Esso Research started its operations analysis was "to get at least a dollar's worth of return out of every dollar spent." To this, Vice-President Hewlett adds, "Every oil company has to worry about efficiency to stay in business. We ourselves are not financed by the parent company (Jersey Standard) in any way. Our affiliates are free to buy their research and engineering wherever they want. We've got to offer our services at a reasonable price, or we have no customers.

"If we can complete the design of a refinery two weeks ahead of schedule, or if research aimed at lower costs is finished faster, we gain a big advantage."

A big target for the company is to expand its basic operations—re-

". . . with everyone in the company pitching in, the possibilities are unlimited. . ."

BEST FROM JOBS starts on p. 27

search and engineering—"without a corresponding increase in the size of supporting groups." Says Executive Vice-President E. Duer Reeves (who heads the operations analysis committee), "We are trying to make sure that every job is worth while, that everyone is doing his best work, and that everyone has the right tools."

Adds Hewlett, "Both technical and nontechnical people must have a challenge. We're out to mechanize all menial jobs. Interesting work is a key factor in today's tight manpower market. And this applies to engineers and scientists, as well as to others."

III. Benefits Mushroom

A total of 394 different improvements contributed to the $1-million-plus in direct savings from work simplification during the first 12 months. This makes the average new idea adopted worth more than $2,500. Cost of the program has been only 10% of the savings.

Stewart C. Fulton heads the full-time study group that helps to make the operations-analysis wheels turn. He says, "A point to remember is that the savings made with work simplification are recurring each year. And there are some improvements coming up that will be a lot bigger."

Even more important than the direct benefits are the intangibles—especially in better human relations. "For the first time," Fulton observes, "some of our first-line supervisors feel they are a real part of management."

Vice-President Hewlett adds, "Some of our people are taking a new lease on life. Evidence is the large increase in suggestions in the Coin Your Ideas program. We should get up to 2,500 ideas this year, compared with the 1,453 we got last year."

Topping the list of improvements that are of help to engineers and scientists has been the mechanization of analytical and inspection procedures. These men are getting better and more complete data, more quickly than before.

Although the nonrepetitive work of the technical men is hard to fit into work simplification, Fulton points out that "there is an orderly way to work, no matter what you're doing. Once you get people trained, you find the principles apply to everyone."

Fulton says that the few engineers who have had work-simplification training so far have already reaped a benefit from analyzing their operations.

"The professional people can plan their work better from a services standpoint," Fulton says. "They can do a better job of setting up experiments that involve men and machines. And much of the progress comes simply through the combining of several steps into one."

Example: One man previously walked three-quarters of a mile in the lab while completing a series of analyses. By combining steps and grouping materials, he was able to cut the distance to 600 ft.

Companywide, the greatest tangible benefit has been ending duplication of effort. And near the top of the long list of specific improvements has been the start of self-service in stockrooms. This was one of 120 improvements made in the Products Research Division alone. These touched on almost all of the division's activities, including engine and test-car work, construction, records, travel tickets, and lab schedules.

During the last half of 1955, the division actually was able to increase its professional staff by 20 without adding to the supporting service.

In the Process Research Division, an experiment is under way with a battery of dictating machines. The potential gain would be a two-thirds reduction in the time technical men spend on correspondence (until now, letters and reports have been written out largely in longhand before typing by stenographers).

Also in Process Research, there has been an annual saving of $15,000 from a streamlined method of recording employees' time.

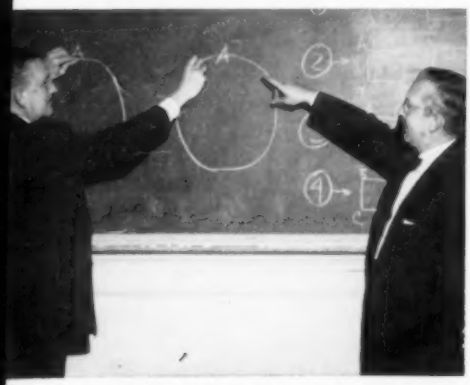
In the company library, women cut from 109 to 50 the number of steps needed to prepare 500 volumes of periodic journals for binding.

IV. Employee Holds Key

Esso Research thinks the secret to the success of work simplification is to have employees do the streamlining themselves. "You can't walk behind people with a stopwatch," says Fulton. "You can't bring in an expert who tells people what to do, without getting a violent reaction. You must have participation by everybody, and a feeling that the accomplishments are those of everybody. This is the reason each of our divisions has the responsibility for running its own show. And work by the management of the divisions has been a big help in spreading the roots of the program down through the company.

"The new mail system started as a

'Games' get idea across



USING BOTH HANDS to draw figures, work simplification trainees learn principles of best way to work.

PUTTING PEGS into pegboard by various method, trainee learns how to study operations to save time.

TAKING PENNIES off table in competition, trainees find out there's a fastest way for every job.

DICTATING MACHINES are being tested by engineers for report-writing, now often done in longhand.

NEW MAIL CART has labeled folders for sort-as-you-go delivery. It's a feature of new central mail system.

SELF-SERVICE stockrooms are among greatest gains. Changeover has saved time formerly lost in waiting lines.

cooperative experiment by the divisions which wouldn't have been possible before the program started.

"On all levels, the job is to encourage an employee to think how he is doing his job, so that the flow of ideas comes naturally."

Presence of union men on the operations-analysis study group has been a big help. Fulton explains, "You couldn't progress very far if you didn't have the support of the union people as a team."

The view of the union itself (Independent Laboratory Employees Union) is expressed by its recent president, Eugene V. Rodgers, this way: "We have found that the operations analysis committee has had the best interests of the employees at heart. Because we union men represent some 1,300 employees, I feel that continued joint participation by union and management is important to employees and vital to the program."

And Fulton adds, "If a division finds an employee's work isn't productive, it merely moves him into work that is."

Fulton also is strongly convinced that employee cooperation will not automatically continue. "We'll have to keep the program before our people's eyes," he says. "We'll have to give recognition to accomplishments and hold refresher courses. Otherwise the program will die, just as safety does when you ignore it."

V. Needed: Push from Top

The conviction that operations analysis required real backing from management led Esso Research to build a strong organization behind it. At the top is a ten-man committee headed by Vice-Presidents Reeves and Hewlett, with the company's department heads as the other members.

Handling the daily operation is Fulton's eight-man study group.

The full-time staff comprising this group started cold in April, 1955, with no experience in operations analysis. They were told to see what improvements could be made.

They had no idea their studies would lead them to work simplification. They decided it was the best tool only after interviewing key people in each division, investigating new efficiency devices on the market, and learning what other companies had done.

Fulton doesn't think "experts" are necessary for study-group membership. His view: "A man should be a good listener, with some analytical ability. And he must be able to submerge his personal interest in that of the departments. He can't go around talking about what he did."

VI. Training a Must

Esso Research has already trained close to 300 employees in work simplification. The goal is to train all 2,500. To start the program last year, each department held a mass meeting to have the program explained.

"This allowed all fears and doubts to be expressed at the start," says Fulton. "And it prepared employees for the formal training to follow."

The company next had 120 key people take a ten-hour course (two hours a week) in work simplification, with NYU's Prof. Mullee as instructor. Groups of about 18 went to class at the Esso Research Center in Linden, on company time.

Mullee also gave an intensified one-week course for the study group, several supervisors, and three men from the Esso Research Laboratories at Baton Rouge.

Early this year, 90 supervisors took an expanded, 20-hour course, held over a period of ten weeks. These sessions were led by study-group members.

The company is now starting condensed courses that will reach every employee. The initial effort was the three-hour course (an hour a week) completed last week by nontechnical people in Products Research. Roundtable talks were led by division supervisors.

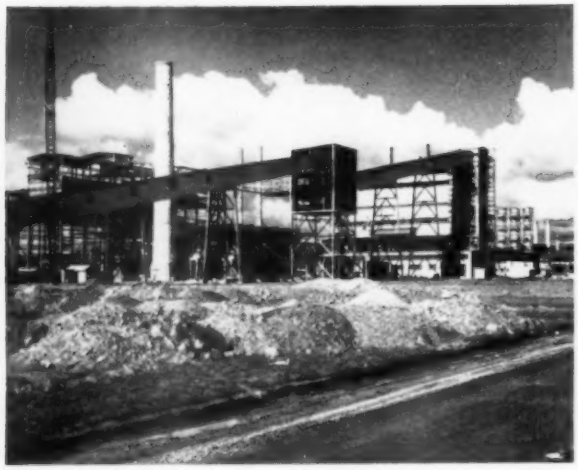
In addition, the company has spotted over the past year a series of special roundtables on such subjects as purchasing, personnel records, and printed materials and forms. The series opened up good cross-communication, since representatives from all divisions affected were present.

Fulton believes the roundtable is the best way to resolve differences of opinion.

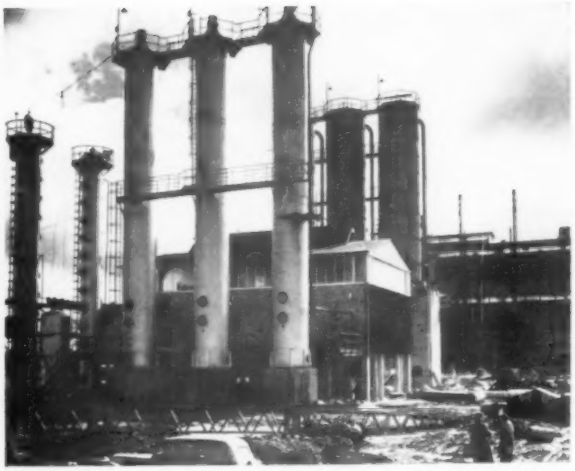
Throughout the training, stress is on open-mindedness. Wide use is made of brainstorming, with employees encouraged to consider any idea a possibility.

The next moves? Besides planning to bring its engineers and scientists in on a formal basis, the company hopes to turn its study group loose on big-potential projects. Fulton sums up, "More and more, the study group will be getting into over-all problems that cross departmental lines.

"More of the training will be taken over by the divisions themselves. The program is permanent. And with everyone in the company pitching in, the possibilities are unlimited."



ENTER: Lignite moves into gasification plant on conveyor belts.



EXIT: Gas, liquid fuels, and chemicals come from fractionators.

Australia to Make Fuels from Lignite

Australia, unsuccessful in finding domestic petroleum reserves, may be successful in gasifying lignite into liquid fuels, fuel gas, and raw materials for chemicals.

This week the State Gas & Electric Corp. is nearing completion of a $24-million lignite gasification plant in the Latrobe Valley of Victoria.

Low-pressure tests of the facilities are being run. The plant is scheduled to commence full operations in October. By then a 103-mi. gas pipeline to Melbourne will be completed.

Initially, the yield from lignite will be primarily fuel gas and tar, with a small volume of gasoline produced as a byproduct. But the present plans are to make synthetic gasoline the prime product by 1960.

Gasoline production at the start of operations will only amount to about 820 imperial gal. daily. At the same time, the plant will turn out about 18-million cu. ft. of gas a day for the Melbourne market.

But within the next three to four years, the operators plan to boost the gasoline yield to more than 160,000 gal. daily. The plant will also produce diesel fuel, heating oils, and increasing volumes of gas, and chemicals.

Current reports are that a motor fuel of about 85-octane rating will be produced. The plant will have to produce high-quality fuel products in order to compete with the petroleum-derived fuels from Australia's nine refineries, four of which are new or recently modernized plants.

The incentive to produce high-quality, competitive fuels will be provided by Australia's desire to reduce its dependence on oil imports from the Middle East and Far East.

Australia is using the Lurgi process of lignite gasification, which has been used successfully in Germany since the mid-30s.

Australian engineers examined the German facilities and arranged to import necessary equipment and know-how before the plants were taken over by the East German government.

The process, developed by Dr. Dorschner, of Lurgi Gesellschaft, gasifies lignite or other noncoking coals.

The process, as designed for the Australian plant, will use lignite as both a plant fuel and a raw material. Lignite will be burned to provide steam, which will be superheated to 977F by firing waste gases from the Lurgi generator.

The lignite as a raw material will be partly dried, briquetted, and fed to the generator. There it will react at 450 psi. with steam and oxygen from an adjoining air-separation plant.

In the lowest portion of the fuel bed, a secondary reaction—hydrogenation—will cause hydrogen to react with carbon to form methane gas.

Higher in the fuel bed, the descending briquets are subjected to distillation, which enriches the gas product stream with other light hydrocarbons.

Pressurized gas from the generator is stripped of impurities and liquid byproducts by scrubbing, cooling, and fractionation in a column.

Regardless of its success in Australia, lignite gasification will offer no worldwide competition to oil for fuel markets, except possibly in a few non-oil-producing areas. Lignite could eventually become competitive with both oil and coal as a chemical raw material, though.

In the U. S., lignite so far hasn't been able to compete with the plentiful supply of black coal as a source of chemical raw materials, primarily tar. One of the primary reasons is that lignite contains a lot of water (roughly ⅔ by weight) which makes it less economical than coal. Also, lignite yields a low-temperature tar which contains no naphthalene and few marketable tar acids.

In Australia, the primary reason for considering lignite gasification is a growing shortage of black coal—rather than the lack of domestic petroleum reserves.

Coal is being used as a raw material for liquid fuels in a South African government-owned plant (PW—Jul. 8'55,p35).

Aluminum Co. of America has an experimental program under way at Rockdale, Tex., to produce tar from lignite.

The pilot plant is producing about 16,000 gal. a day of low-temperature tars. The Rockdale pilot plant is operated in conjunction with Alcoa's aluminum smelter, which uses dried lignite and carbonized lignite (from the pilot plant) as fuel for generation of power.

Nine chemical companies are participating with Alcoa in a research and utilization program on chemical and fuel possibilities from lignite.

What's New / IN REFINING

Indiana Develops Urea Dewaxing for Lube Oils

Standard Oil Co. (Indiana) has developed a new process for dewaxing lubricating oils, which uses urea.

The process is designed to produce high-quality, low-pour-point lubes with viscosities in the range of 250 SSU, at 100F.

The company is building a unit at its Whiting (Ind.) refinery using the process. It is scheduled to go on stream in October. It will have a designed capacity to produce more than 10-million gal. annually.

The important advantage offered by the new urea dewaxing technique over conventional methods is that it eliminates the need for special low-wax crudes to make high-quality (low-pour-point) lubes.

Most lube oil stocks contain straight-chain hydrocarbons that form solid wax in cold weather, slowing, and sometimes preventing, oil flow.

In the Indiana dewaxing process, according to Joseph K. Roberts, general manager of research and development, the lube stock is contacted with urea. The straight-chain hydrocarbons in the stock unite with the urea, forming solid adducts that can be filtered out.

Since the adducts form at room temperature, the new urea process does not require a chilling step, which is necessary in other dewaxing processes.

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Esso Expands in England

Esso Petroleum Co., Ltd., is expanding its Fawley (England) refinery by 60,000 b/d, to 210,000 b/d.

The program is an expansion as well as a modernization step, and will cost an estimated $36.4-million. It follows close behind a recently-started $25.2-million petrochemical building program at Fawley (PW—May4'56,p38).

In addition to adding a third crude unit, Esso Petroleum will build two more hydrofiners for fuel oil treating. Two similar units are now on stream at Fawley.

A second sulfur-recovery plant, which will produce a 99.9% chemically pure rock sulfur, also will be built. It will boost the sulfur-recovery capacity to 14,000 tons annually. The raw sulfur will be supplied by the hydrofiners.

Additional construction at Fawley will include new tankage, a new jetty at the marine terminal, and a second water purification plant.

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A reverse twist to the American entry into petrochemical output abroad occurred last week with the entry of a British chemical firm into U.S. petrochemical operations.

Imperial Chemical Industries, Ltd., of England, and Hercules Powder Co. are teaming up to build a $11-million plant at Louisiana, Mo., near a Hercules ammonia plant, to manufacture methyl methacrylate. The product is a glass-like plastic used widely in aircraft, automobiles, and illuminated signs.

Natural gas and ammonia will be the primary raw materials.

•

Premier Oil Co.'s 4,500 b/d refinery at Longview, Tex., will be modernized with the addition of a platformer and unifiner.

R. P. Hargis, president, says the program will cost $1¼-million and will also include working on the existing thermal cracker. This is the first step taken to improve Premier's facilities since the recent acquisition of the company by City Products Corp., of Chicago (PW—Jul.13'56,p41).

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Two refineries closed since early last spring were getting back into operation this week.

Cities Service Refining Co.'s 52,000 b/d plant at East Chicago, Ind., closed since early in April, was resuming operations following settlement of a strike with members of the Oil, Chemical & Atomic Workers Union (PW—Jul.20'56,p11).

Shell's Anacortes (Wash.) refinery, which was shut down last March—shortly after it went into service—resumed operations on a limited basis.

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Sioux Oil Co. plans to add a light-ends recovery plant at its 4,000 b/d refinery at Newcastle, Wyo. The proposed recovery unit, costing $85,000, is scheduled for completion by mid-September.

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Bolivia's Doors

The South American neighbors, Bolivia and Argentina, are two countries in a hurry to develop their oil resources.

Bolivia has faced the fact that it must diversify its one-industry (tin) economy before it falls apart; it is counting on the income from its oil to enable it to do that.

Argentina has to pull itself by its own bootstraps from the morass of debt in which the Peron regime left it; toward this end, it feels it must achieve self-sufficiency in oil.

But the two have adopted diametrically opposite policies for oil exploitation:

- **Bolivia has written an oil code that cordially invites foreign capital to come in** and get concessions (PW—Jun.15'56,p33). It's expected to be formally ratified next month.

- **Argentina is firmly wed to a policy of refusing concessions** and trying to get the oil out itself.

Oil officials in the two countries are eyeing each other's progress.

At present, Bolivian faces wear the smiles while Argentine faces are rather glum.

Argentina is currently struggling with the thorny problem of how to attract foreign capital for its oil program without granting concessions. Argentine public opinion, educated for years to a fiercely nationalistic feeling about the country's natural resources, makes the oil issue a touchy one politically.

In Bolivia, on the other hand, public opinion follows the government policy, "when the government is acting for the good of the people," said Jose Pas Estenssoro, president of YPFB (Yacimientos Petroliferos Fiscales Bolivianos), in a talk last week with PETROLEUM WEEK's correspondent.

Bolivia knows it needs foreign cooperation, because "the country itself can't afford the huge investments that are necessary to make a go of a nation's oil industry," says Paz Estenssoro.

"We decided something had to be done," he says, "to free Bolivia from

Opening Wide to U.S. Oil Capital

the one-product economy that made us dependent on economic cross-winds. So we sat down, and, with the help of foreign oil codes, we drafted the Bolivian oil codes, which opens the doors for foreign capital to move in and contribute to development."

There are several American oil companies looking around in Bolivia just now. Among them are: Socony, California Exploration Co., Pure Oil, Richfield, Standard of Ohio, and International Petroleum Co.

The general manager of YPFB, Eduardo Hinojosa Acha, present at the same interview, said:

California Exploration is reported to have applied for permits to survey 45.8-million acres, and Bolivian Gulf Oil Co., 77.2-million acres. Both permits are in Zones 1 and 2, available to private operators under the new oil code.

"After the new congress formally approves the Oil Code in August, Bolivia expects offers." Bolivian elections in June chose a new government which is committed to carrying on the policies of the present one.

The contract signed with Gulf (PW—Mar.30'56,p37), Hinojosa pointed out, gives Gulf development rights on government-held land in the oil zone reserved to YPFB under the new code, as well as calling for Gulf investment in one and possibly two pipelines.

Gulf hasn't started work yet, so Glenn McCarthy, at the moment, is the only foreigner at work in Bolivian oil. The Texan has four wells on land being exploited under a previous contract with YPFB, and expects to drill 40 more within the next 18 months.

He has recently signed a contract to supply an Anaconda Copper Co. subsidiary, the Chuqicamata mine in Chile, with gas by pipeline which is yet to be constructed (PW—May 11'56,p49).

"We are proud of our new code," says Paz Estenssoro. "And we are also proud to have proved that the state can be a good administrator.

"We have brought in enough oil to satisfy our home markets and export to neighbors. Now we are ready to enter the world market, once the pipeline to Arica is finished and the Pacific Ocean is accessible to us.

"We expect to achieve a gross income of some $60-million in foreign exchange from our oil, and we are going to use that to foster long-range agricultural programs and other projects."

"Bolivian oil productive capacity at the moment," Hinojosa explained, "is 12,000 b/d. However, since there are not enough customers yet, especially with Argentina's failure to accept the oil she had contracted for, production has had to be restricted to 7,500-8,000 b/d."

The 1952-55 record, Bolivians feel, shows what the country could do on its own.

In 1952, YPFB produced only 800 b/d. That year a development plan was formulated, and in August, 1955, the first well under the new plan was brought in. By March, 1954, Bolivian production met total domestic requirements, saving some $8-million a year in foreign exchange.

In 1952, YPFB had two drilling teams working. Since then the oil entity has spent some $20-million on equipment, from Ansco, Cardwell, National, and Oilwell, and now has 11 "equipos" at work.

The Bolivians are proud of that record, but they are also proud that they were realistic enough to see that full development can come only with the aid of foreign capital.

The YPFB president, Jose Paz Estenssoro, is a brother of Bolivia's retiring president, and has worked with him from the beginning in formulating the country's oil policy.

Eduardo Hinojosa Acha, general manager of the oil entity, has been employed by YPFB since 1938. In 1946 he went to the U. S., where he studied at the University of California at Berkeley for five years and took an engineering degree. Hinojosa practiced for several months in Venezuela with Schlumberger and returned to Bolivia in May, 1952, to take over his present position.

Observers wonder: If Bolivians make rapid progress after the new Oil Code is ratified in August, what effect will this have on Argentine resistance to concessions and leasing arrangements?

Today, Argentina is producing only 4 million cubic meters a year, against present domestic requirements of 10-million cubic meters, according to a statement by President Pedro Aramburu on July 2. Its oil reserves appear to be big enough to supply the country's needs, but so far, plans for getting the oil out of the ground and transported to market are largely on paper.

Argentina's ambitious oil program calls for achieving self-sufficiency by 1960, but its most optimistic planners admit this plan depends on being able to borrow the money with which to carry it out.

Many Argentine oil men are rather wistfully eyeing the new Gulf contract in Bolivia.

Here is the picture of Bolivian oil today:

I. Refineries

They are processing something over 7,000 b/d, with a yield of 48% gasoline, 12% kerosine, 17% diesel oil, lubricants, etc. Requirements could be satisfied by a good deal less crude oil, except for the fact that Bolivian oil is very light, 53 to 63 gravity, API.

Existing refineries are:

(1) Cochabamba. This plant, built by Foster Wheeler, has 6,000 b/d capacity and is working at full capacity with 200 workers.

(2) Sucre. Of the two plants here, one has 1,000 b/d capacity and is the only one working at present. The other, with 3,000 b/d capacity, will be transferred to Santa Cruz, to supply increasing local needs of that area and to increase oil exports to Brazil by about 150%. This plant was also built by Foster Wheeler.

(3) Camiri. The plant there, with 1,500 b/d capacity, was built by YPFB. It is now producing only about 200 b/d, to satisfy local needs. This refinery is located at Bolivia's most important oil field (where a

total of 1,100 workers are employed in all activities).

(4) Sanandiata. The small, 400 b/d plant here works for local needs. It was built by YPFB.

(5) Bermejo. This smallest of the country's refineries produces only for YPFB internal use.

II. Pipelines

A total of 1,149 kilometers have been completed, all constructed by Williams Bros. under contract to YPFB.

Finished pipelines are:

(1) Camiri-Sucre-Cochabamba 525 km. This 6⅝ in. line cost $9-million. Its capacity is 8,000 b/d.

(2) Camiri-Yacuiba, 254 km., 6⅝ in., capacity 18,000 b/d. This line cost $4-million.

(3) Cochabamba-Oruro-La Paz, 370 km., capacity 8,000 b/d. This line was finished in February of this year. It is adapted for transportation of both crude and refined products, and cost $8-million.

Pipelines to be laid during 1956-57 are:

(1) Sicasica-Arica, 350 km. Sicasica is a point on the present Oruro-La Paz pipeline, whence the new line will carry oil to the Chilean port of Arica on the Pacific, for shipping.

The line will carry oil across the Bolivian Altiplano to its highest point, in the Andes, of 14,200 ft. above sea level. This section will use 10¾ in. pipe. Since gravity will suffice to carry the oil down to sea level, 8⅝ in. pipe will cover the remaining 50 km. Bolivian Gulf Oil company, under terms of its recently signed contract with the government, will put up $5-million of the $10.5-million cost on this line.

(2) Camiri-Santa Cruz, 300 km. YPFB will construct this line at an estimated cost of $4-million, to carry crude oil from the Camiri field to the refinery which is to be brought to Santa Cruz from Sucre. Capacity will be 4,000 b/d.

Other pipelines planned for the future are:

(1) Yacuiba-Bermejo, 140 km., capacity 18,000 b/d, estimated cost $3-million. No bids have been called for this project as yet.

(2) Camiri-Sicasica, about 550 km. This line will supplement existing lines covering the same space. Bolivian Gulf has the option to finance this line, whose estimated cost is $35-million, when production in the Camiri fields has reached a specified amount and proven reserves justify the pipeline. (YPFB men say it should be finished by 1962.) It will use a combination of 12¾-in. and 10¾-in. pipe, and will have a capacity of 50,000 b/d. This line will serve both for internal consumption and for export. From Sucre on it will carry oil destined for export via the Pacific port, Arica.

III. Exports

Bolivia is now exporting $6-million worth of oil a year to its neighbors, according to YPFB figures. Brazil takes $800,000 worth a year; Chile, $700,000; Paraguay, $45,000; and Peru, $300,000 worth.

The balance goes to Argentina, which is the largest export customer even though it is currently taking only a fraction of what it contracted for under the 1954 treaty by which it agreed to take oil in payment for a railroad, cattle, and textiles.

Bolivia's over-all foreign-exchange "profit" on oil is $14-million as compared with 1952, Hinojosa points out. This figure is obtained by adding the $6-million of oil exports to the $8-million that was formerly needed for oil imports.

By 1958, YPFB plans to call for the export of another $3-million worth of refined products a year to world markets, via the Sicasica-Arica pipeline and the Pacific ocean. In addition, if Argentina has solved its transportation problem by then, that country will be taking some 5,000 b/d, an increase of about 300% over its present purchases.

By 1960, exports through Arica will have reached $6-million a year, according to plans. In addition, it is expected that exports to neighboring South American countries will also have increased.

Venezuela Pushes Gas Network

Venezuela will spend an estimated $42-million on pipeline construction in the first stage of its projected nationwide gas distribution network.

Minister of Mines & Hydrocarbons, Dr. Edmundo Luongo Cabello says a pipeline will be built from La Mariposa, a district of Caracas, to Valencia approximately 100 mi. west (map). It will serve industrial centers along the route.

From Valencia it will be extended to a distribution center at Moron, on the Caribbean coast, where plants of Venezuela's new petrochemical industry are under construction.

A $19-million contract has already been let for a 205-mi. pipeline to carry gas from fields around Anaco in eastern Venezuela to La Mariposa, where gas turbines are being installed in a big electric power plant.

Under study as a fourth major link in the network is a pipeline from Moron to Cardon on the Paraguana peninsula, site of Shell's' big refinery.

In addition Shell has announced plans to build, itself, a 177 mi. gas pipeline to Cardon from the La Paz field west of Lake Maracaibo (PW—Dec.16'55,p27).

The government network will be built by the newly created Venezuelan Petrochemical Institute, attached to the Ministry of Mines & Hydrocarbons.

Additional funds will be spent by the Venezuelan Development Corp., a government agency, for construction of municipal gas distribution systems. The corporation operates more than a score of regional electric power systems, and it plans to use gas in generating plants.

Venezuela produced nearly 860-billion cu. ft. of gas last year, and flared more than 70% of it.

As New Egypt Concession Awards Near...

... Dallas Firm Is Leading Contender

General American Oil Co., of Dallas, this week was regarded as the leading contender for Egyptian oil concessions on a "government participation" basis.

Gordon Simpson, company president, has made a belated offer to the Egyptian government for a concession over the entire available area in the Delta, Eastern Desert, and Sinai.

He confirmed to PETROLEUM WEEK's correspondent that his offer included the controversial government participation.

The Dallas company reportedly raised its royalty offer to 27%, in addition to 49% Egyptian participation— the highest bid received so far by Egypt, according to Egyptian sources.

Earlier, it was reported General American had offered 16% government participation in addition to 25% royalties, and split in net profits after a number of years of oil production. It was also reported to have offered to spend $11½-million in exploration.

Meanwhile, Tidewater Oil Co., appeared out of the race, after raising its royalty offer to 27% but refusing to accept government participation.

David Staples, Tidewater president, who was visiting in Cairo last week, was pessimistic over his company's chances of getting a concession in Egypt.

Despite repeated Egyptian coaxing that government participation would make Tidewater a sure winner, the company has refused to accept that principle.

"Government participation," says a company spokesman, "is something no major company can offer."

Meanwhile, M. H. Mitchell, Tidewater's land department manager, who has been in Cairo since the company made its offer last Apr. 2, has left for San Francisco.

He is due back in the Middle East —but not in Egypt—as manager of Tidewater's operations in Turkey, which are just starting.

President Staples came to Cairo from the Kuwait Neutral Zone, where Getty Oil Co. (affiliated with Tidewater) is building a stabilizer now and has three rigs running.

Sahara Petroleum Co., Continental Oil Co.'s affiliate, is also out of the race on new bids.

Millard Neptune, Sahara president, says "the price is too high." The company has also declined government participation.

Meanwhile, Ralph E. Fair, Inc., of San Antonio, is reported to have lost ground in the brisk bargaining with Egyptian officials.

After starting the race well ahead of the others, Fair is reported to have cut his 33⅓% government-participation offer by nearly half, making up for it with higher spending and royalties.

... Ministry Reshuffle Won't Cause Delay

President Nasser's recent cabinet reorganization and reshuffle of ministers has affected the General Petroleum Organization and the Fuel Dept., though not basically.

Here's how:

Under the shakeup, Nasser split the former Ministry of Commerce & Industry, headed by Dr. Mohammed Abu-Nosseir, into two ministries. Abu-Nosseir became Minister of Commerce.

The new and more active Ministry of Industry went to a newcomer: Dr. Aziz Sidky, a post-graduate product of U.S. universities and a Ph.D. from Harvard. He is 36.

Abu-Nosseir and Sidky got together and divided the departments of the old ministry between themselves.

Sidky got the Fuel Dept. and the General Petroleum Organization (HAP), which is an independent body attached to the ministry.

Abu-Nosseir had over-all authority over oil affairs when he was Minister of Commerce & Industry, by virtue of the amendment of the 1953 mining law. Before the HAP came into being last month, he was considered responsible (with Mahmoud Abu Zeid of the Fuel Dept.) for the delay in granting prospection licenses to the 61 areas asked by the Shell-Socony group, and other offers for concessions.

Cairo oil men queried by Petroleum Week said the shift in departments and ministries should not affect Egypt's oil policy or the decision on the offers made in April by 12 (now 13) international and Egyptian oil concerns. These sources said Col. Mahmoud Youness, chairman of HAP, makes the decisions, and that he is the man to watch, not Sidky.

Last week the Egyptian press announced that HAP had already reached its decision on the concession offers. This sort of talk apparently rubbed Sidky the wrong way.

He denied imminent signature of leases. He said all offers were "still under technical study," and that no decision had been reached.

He said that, since he was new to his job, he had to make a "careful study of all offers, which will have a great effect on Egypt's oil resources."

But Sidky's protestations are not taken too seriously in informed quarters in Cairo.

Reliable Egyptian sources say that HAP has indeed already reached its decision; that it has picked five out of the 13 companies that bid for concessions.

All five had offered government participation, on government insistence, the sources said, and that was the deciding factor in why they were chosen.

Out of these five, two or three would get the concessions over the available areas in Egypt—above the 26th parallel, in the Delta, Eastern Desert, and Sinai. According to this source, the cabinet will pick the winners out of the list of five in one of its forthcoming meetings.

Sidky says he has obtained 16-million Egyptian pounds for his ministry, which he considers very good for a just-starting department. Of this, he is allocating 9-million Egyptian pounds ($21.6-million) to the operation of HAP.

Previously, government sources had said HAP's first budget would be $7.7-million, devoted mostly to pipelines and refinery and storage installations. Sidky says the high allocation for HAP in his Ministry's budget was made to enable HAP "to carry out its many projects, including prospecting for crude oil."

To Join Turkey Refinery?

A major U.S. oil company may acquire a minority participation in Turkey's first privately owned refinery, to be built by Turkish American Oil Co. (Taco), a joint American-Turkish group.

Final details of the participation are now being negotiated, according to Frank S. Hilaire, president of the new Taco group. Hilaire was formerly associated with Trinidad Leaseholds, Ltd., and The Texas Co. Neither of these two companies, however, is in on the Turkish American deal.

The U.S. major is to supply the new refinery's 15,000 b/d capacity for the first three years with crude from "either Saudi Arabia or Iraq," Hilaire told PETROLEUM WEEK.

After that, it is hoped that sufficient Turkish petroleum may have been discovered and developed to start replacing imports with domestic supplies, he said.

He declined to identify the U.S. major other than to say it was "one of the big international companies" and one "now prospecting for oil in turkey."

Later, Turkish American plans to develop into a "fully integrated oil company" in Turkey, with its own direct marketing outlets, Hilaire said.

Taco expects to enter retail distribution—with its own brand name and service stations—a year or so after the refinery is in operation.

It hopes to acquire Turkish production through the exploration and production activities of the U.S. major company that is acquiring a minority participation in Taco.

Contract for engineering and construction of the $12-million plant is expected to be let within 90 days.

The plant will be located in Istanbul, on the Asiatic side of the Sea of Marmara, not in Izmit as has been reported, according to Hilaire.

He said proposals are now being submitted by four firms: M. W. Kellogg & Co., The Lummus Co., Foster-Wheeler Corp., and E. B. Badger & Sons, Ltd.

Units will include crude and vacuum distillation, catalytic cracking with complete vapor recovery, and catalytic polymerization.

Construction is expected to start near the beginning of next year. Target date for the refinery to go on stream is August, 1958.

Because of Turkey's rapidly growing oil consumption, the refinery is being designed for expansion to 25,000 b/d.

Current Turkish consumption is around 22,000 b/d. This will almost be met by Taco's initial capacity of 15,000 b/d, plus the new 7,000 b/d government plant at Batman, in eastern Turkey.

The latter is operated by Turkish Petroleum Corp., the state-controlled company which also operates the country's only two oil fields, Raman and Garzan.

The government refinery was completed several months ago by Ralph M. Parsons Co., Los Angeles. Its first gasoline was marketed in Iskunderun last April.

Participants in the privately owned company include Turks as well as Americans.

Nasit Fesci and Dr. A. C. Birtek, two Turkish importers, will be directors of the organization. Other officers will include Attila Turkkan, a Turkish attorney in New York, and Roger Dunn, U.S. equipment man.

Authorization for construction of the plant was received from the Turkish Council of Ministers, and signed by the President, last April.

Executive offices of the company will be in Istanbul.

Financing is being handled by William Blair & Co., Chicago investment firm.

The new private refinery to be built by Turkish American is of major importance to the country, as it will help reduce a heavy drain on Turkey's hard-pressed foreign exchange position.

The country is reported to owe something like $40-million to Socony Mobil Oil Co., British Petroleum Co., and Royal Dutch Shell for refined products previously purchased on credit.

Venezuela Gets 25 Bids

CARACAS—Twenty-five bids were received on Venezuela's second offering of concessions, sources in the Ministry of Mines & Hydrocarbons disclosed last week.

Bidding closed July 13 on six national reserve tracts in Lake Maracaibo totaling 42,678 acres (PW—Jul.13'56, p21).

Minimum bonus on the lots was set at $607 per acre. Sealed bids were required under terms of the law governing concessions on national reserves.

There is no official announcement yet of the first award of eight tracts covering 24,700 acres each in Lake Maracaibo, or of bidding on open blocks around the Mara field.

Among companies who have recently declared themselves in the race for concessions is the French firm, C. A. de Intereses Petroleros en Venezuela.

Count Francois Emmanuel de Croy, manager of the company, said Intereses Petroleros applied for concessions in the southwestern states of Barinas and Apure.

These states were singled out for attention by Venezuela's Minister of Mines & Hydrocarbons, Dr. Edmundo Luongo Cabello, when the government called for new bids in January this year.

He said new concessions are desirable in Barinas because proven reserves there are not considered commercial, and intensive exploration is needed.

Cabello cited Apure as a new area for exploration.

The French firm is prepared to spend $30-million on initial development if it gets concessions. It would ship all its oil to France, according to Count de Croy.

Intereses Petroleros has spent $1.5-million on exploration in Venezuela over the past four years.

Government officials last week clarified an earlier announcement that an added 8% production tax may have to be paid on new leases (PW—Jul.13'56,p21).

The statement was included in the announcement calling for bids on national reserve areas in Lake Maracaibo. It was not clear at first whether this might mean an extra 8% tax on national reserve lands. However, official sources have explained that this was meant to refer only to the previously announced extra royalty of 8% that might be assessed on crude refined outside of Venezuela in areas not considered to be consuming centers (PW—Apr.13'56,p28).

Venezuelan production meanwhile has climbed to new record levels.

The Ministry of Mines & Hydrocarbons reports average daily production in June hit an all-time high of 2,446,157 bbl. after dipping slightly in April and May.

The daily average for the first six months of this year was 2,362,871 bbl., compared with 2,110,304 bbl. for the same period in 1955.

What's New / AROUND THE WORLD

'Slight' Oil Show at Dhofar Wildcat

DHOFAR—Rumors that Cities Service's second wildcat in Dhofar had found a "good oil show" at 2,500 ft. were denied last week, by company officials. They confirmed, however, that a "slight" show of 18-gravity oil and one or two gas shows had been encountered.

So far, nothing commercial is indicated at the well, Dauka No. 2. Last week, it was drilling at around 4,800 ft. The small oil show was encountered between 1,900 and 2,100 ft.

Dauka No. 2 is located about 35 mi. from the coast, in Dhofar Province of the Sultanate of Muscat & Oman. It is about 80 mi. southeast of Dauka No. 1, which was completed last February at about 12,000 ft. without encountering any oil shows (PW—Dec.16'55,p26).

Operations are being handled by Dhofar Cities Service Petroleum Corp. for the joint account of Cities Service and Richfield Oil Corp.

Considerable interest is focused on the Dhofar wildcat, which is one of two exploratory tests now being drilled in the southeast part of the Arabian Peninsula. The second, at Jebel Fahud in the Sultanate of Muscat & Oman, is being drilled by an affiliate of Iraq Petroleum Co.

The Jebel Fahud well was drilling and coring at 4,860 ft. as of July 11, after earlier casing difficulties. So far, no "bona fide" oil shows have been reported. The rig is equipped to drill to 12,000-13,000 ft.

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Creole, Shell Bids On New Tracts Listed

VENEZUELA—The Official Gazette of July 21 reports that Creole has applied for 26 concessions totaling 50,298 hectares, and Shell has applied for 21 tracts covering 10,000 hectares.

Following are Creole's applications:

Twenty-one tracts totaling 10,298 hectares are underwater off the eastern lakeshore. Three of these cover about 450 hectares each, and the others are 497 hectares each. They are designated as Lama-0-1 to Lama-0-21.

Two tracts of 7,000 hectares each and one tract of 8,000 hectares are on or near the Colombian border in southwest Apure state, in the municipalities of La Trinidad and El Amparo. They are designated Apur-3-1 to Apur-6-3-3.

Two tracts of 9,000 hectares each are on the Colombian border in the far northwest, in Guagera municipality of Zulia state. They are designated Zuli-7-1 and 7-2. The 21 Shell applications are all for tracts underwater off the eastern lakeshore. They are designated Lama-0-1,000 to 1,020. The first in the series is 420 hectares; the others are all 479 hectares.

Creole's bids were dated July 6 and 9. Shell's bids were dated July 12.

After publication of bids in the Official Gazette, other companies are allowed (30) days to file objections before the government makes a decision.

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To Start Fifth Wildcat

EGYPT—Sahara Petroleum Co. is about to abandon its second wildcat in the Western Desert, and to start on its fifth location. After drilling below 13,000 ft. at Wadi Natrun, Millard K. Neptune, general manager of the Continental Oil Co. affiliate, told PETROLEUM WEEK the well was discouraging and was getting close to its end.

The company is planning to move its Wadi Natrun rig to a new site south of the Qattara Depression in a few weeks. Seismographic and geophysical exploration has been going on there for some time.

Meanwhile, Sahara's third wildcat at Marsa Matrouh, west of the company's first wildcat at Borg el Arab (now abandoned), is drilling below 4,000 feet, still with no encouraging sign.

The company's fourth wildcat (third now drilling) is at Gibb Affia, west of the Qattara Depression and close to the Oasis of Siwa. This well is in a different geological province than the other three. Already it is encountering a minor fishing job at 350 ft. Company officials are already showing signs of impatience and discouragement with Sahara's entire Egyptian operation. At a recent meeting with the Minister of Industry, company officials expressed disappointment at the lack of results so far and the huge expenses involved. The same disappointment was indicated this week by Continental Oil Co. officials in Houston.

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Turbodrill for Israel?

ISRAEL—Sale of Russia's much-discussed turbodrill to Israel was under negotiation last week, following signing of a contract for sale to Israel of 40% of its oil needs.

"It is hoped," an Israeli announcement said, "that important orders (for Soviet oil drilling equipment) will be placed shortly by Israeli exploration companies, in which case Russian specialists will travel to Israel to train the local drilling crews.

Israel announced purchase of $18-million to $20-million worth of Soviet crude and fuel oil for 1957-58. This compares with $7-million worth of oil bought from Russia this year.

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Texans Get Concession

HONDURAS—Two more Texans have entered the concession picture in this Central American country. Lester Foran and Lynn S. Holmes, Corpus Christi lease brokers, have acquired 10.3-million acres in Honduras concessions in the Departments of Olancho (northeast) and Santa Barbara (northwest). The grant was approved by Congress and signed by the President.

Other Texans already exploring in Honduras include Houston oil men John W. Mecom and Ernest Cockrell, Jr., who acquired oil rights on Honduras' coastline from Compagnia Petrolera Hondurena, S. A., formed earlier by another group of Texans (PW—Mar.9'56,p21). The latter retained about 15% of their original acreage.

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Ceylon Refinery Off

CEYLON—The new Ceylon government said last week it will pursue the idea of building a refinery with Middle East governments, "notably Iran," but will also consider new proposals from oil companies.

It made this statement after rejecting construction plans for a joint $37.7-million refinery by Shell, British Petroleum, Standard-Vacuum, and Caltex companies.

Prime Minister Solomon Bandaranaike said the Anglo-American group's terms were too "onerous." The group's proposal had been prepared at the request of the previous right-wing government.

NEW BRAND-MARKS, now going up on Socony Mobil Oil Co. and Tidewater Oil Co. stations are . . .

Eye-Catchers to Catch Motorists

Major oil companies are getting more brand-conscious than ever. Two of them—Socony Mobil Oil Co. and Tidewater Oil Co.—are introducing jazzy new service station signs to help sell their brands. And several others are looking in the same direction.

Most majors have been emphasizing brand acceptance in their sales promotion and merchandising programs for a long time. Advertising campaigns, national and local, have also been pitched on selling brand names to the public. Basic to the whole idea of brand acceptance, however, is identification with some symbol—a brand-mark. So oil companies have tried, mainly through mass advertising media, to associate dependability, good service, and even good will with their brand-marks in the public's mind.

Now, however, some majors are making candid reappraisals of just how effective their brand-marks are.

Socony Mobil took up such a study a couple years back. The results really shocked Socony's marketing officials: Only half of the company's gasoline customers referred to it by its proper name—"Mobilgas." Some called it "Socony," while others called it "Flying Red Horse." (A few motorists even thought of it as "Standard." This really hurt.)

The company's marketing officials reasoned that the Mobilgas symbol—a shield with "Mobilgas" and Pegasus sharing billing—was contributing to the confusion. So the company went to work on a new brand-mark. After two years of research, design, and redesign, the new red-white-and-blue symbol (above) is now ready for use wherever the company markets.

Tidewater Oil Co. is another major which recently felt that its brand-mark was not up to par. So the company took down its green-and-cream "Tydol" signs, to put up new, flashier, red-white-and-black "Flying-A-Service" signs (above). The new signs were first used in the company's western marketing areas. Having passed that test with flying colors, they are now being introduced in Tidewater's eastern territory.

Both Socony and Tidewater will also use their new brand-marks on bulk plants, refineries, trucks, and other properties.

Designers say that effective brand identification depends on simplicity. The new oil-company brand-marks are simpler and more direct than their predecessors.

The designers say that simplicity in brand-marks is more important today than ever.

Today's motorist, they point out, drives 50 and 60 mph. in the open country. He's often miles from home and doesn't know when the next station carrying his favorite brand of gasoline will pop up. So he must have plenty of advance notice if he's going to stop safely. That's where an eye-catching station sign, a brand-mark with long-range visibility comes in. If it offers instantaneous recognition, the motorist pulls in, and brand-mark merchandising has succeeded.

Socony-Mobil is shooting for better brand recognition by emphasizing "Mobil" and playing down its flying red horse. Tidewater hopes that its larger "winged-A" will be immediately more recognizable to motorists.

New brand marking is also being looked into by Sinclair Refining Co. and Pure Oil Co.

Sinclair, like Socony and Tidewater, felt that its brand-mark left something to be desired. After months of discussion and planning, a new Sinclair symbol is now off the drawing boards. The company has just introduced it on a trial basis at all of its retail outlets in three cities—Ft. Wayne, Ind., Salt Lake City, and Macon, Ga.

Again, the new approach is based on simplicity. The test brand-mark eliminates the "H-C" part of the old mark and plays up Sinclair instead.

Sinclair will run the brand-mark test "for a couple of months." If consumer and dealer acceptance come up to company hopes, Sinclair will extend the symbol throughout its 37-state marketing territory.

Pure Oil isn't changing its brand-mark. But it's certainly garnishing its stations a bit. The midwestern and southern areas have added red to their blue-and-white station color scheme for the "bold new look."

Pure is also increasing the use of its name on stations. It hopes that more color and more "Pure" will make the stations more easily recognizable.

Besides adopting new brand-marks, suppliers are also coming to this conclusion: It's a good idea to use your brand marking on all products wherever they are sold.

Tidewater isn't the only company that recently extended its brand-mark throughout its marketing area.

Standard Oil Co. of California, for instance, is now extending its Chevron brand-mark through its entire organization (PW—Jul.6'56,p35). Formerly, products of subsidiary companies wore their own labels. But now, California Standard feels that the more the public sees of its brand-mark, the better.

What's New / IN MARKETING

FTC 'Override' Hearings Delayed

The Federal Trade Commission's "overriding commissions case" against three major oil companies (PW—Apr.27'56,p21) has hit a snag. Because of a personnel shortage, FTC may not be able to hold hearings on the case until fall.

Way back in January, FTC issued complaints against The Texas Co., Atlantic Refining Co., and Shell Oil Co. for allegedly forcing their service station dealers to sell certain brands of TBA items exclusively. FTC charged that commissions the oil companies received from the TBA suppliers for "using influence" constitute a restraint of trade under the Federal Trade Commission Act.

The oil companies involved, however, say that all their dealers exercise "free and independent judgment in purchasing TBA items." They maintain that commission agreements between TBA suppliers and oil companies are essential to competitive business and within antitrust laws.

But FTC just doesn't have enough examiners to go around these days. The complaint against Texaco has only reached the conference stage. And proceedings against the other companies have lagged even further. So a ruling on the case appears to be a long way off.

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Detroit Case Appeal

The Justice Dept. is asking for more time to prepare an appeal on the latest "Detroit Case" decision. It wants to see whether the Senate will pass S-11, the "anti-good-faith bill."

Both the bill and DJ's prospective appeal are aimed at the same thing—limiting suppliers' use of the good-faith defense in price discrimination cases. It is now doubtful, however, that S-11 will be passed this session. So DJ wants an extension of time to file its appeal.

If DJ does reopen the case, it can carry the court fight itself, or give the Federal Trade Commission permission to do the job.

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On the fair trade fronts: Socony Mobil Oil Co. has initiated fair trading in Connecticut and Massachusetts and three other majors have matched Socony's fair-trade move in Rhode Island.

Socony, a market leader in all three of these states, began fair trading in Rhode Island last week (PW—Jul.20 '56,p12). Within a few days, Atlantic Refining Co., Cities Service Oil Co., and California Oil Co. did likewise.

This week, Socony brandished its fair-trade weapon in price-war scarred Connecticut and Massachusetts. The company pegged minimum retail prices there, just as it had in Rhode Island, at 19.9¢ a gal. for regular, and 22.9¢ a gal for premium (ex taxes).

Gasoline is now being fair traded in five states: New Jersey, Pennsylvania, Rhode Island, Connecticut, and Massachusetts.

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Wisconsin's trade-practices conference (PW — Jul.20'56,p33) has flopped. Jobber and supplier company representatives participating in the conference last week objected to ten rules proposed by the state attorney general.

Eight of the proposals were turned down because the jobbers and suppliers held them to be illegal under Wisconsin statutes. The other two, say oil people, would have deprived oil companies of their property "without legal process."

The ten rules are a redraft of points made by the National Congress of Petroleum Retailers at recent Federal Trade Commission hearings.

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Vancouver (B. C.) service station dealers who were convicted and then cleared of price fixing may find themselves back in court soon. The dealers—26 of them—were found guilty of conspiring to fix retail gasoline prices last fall. Although cleared of criminal charges, they were fined $1 apiece to "establish a warning case."

The dealers, however, wanting to clear themselves of all stigma, appealed their conviction last March (PW—Mar.30'56,p31) and were given a clean bill of health.

But now, Crown prosecutors have filed application with the Supreme Court of Canada to reverse the decision of the lower court of appeals. The dealers aren't home free yet.

A Full Measure of SERVICE...

This is especially true of the twenty Stores of Wilson Supply Company, located in Texas and Louisiana. Every Store is well stocked with a large, diversified inventory, to serve the needs of the Oil Well Drilling and Producing Industry.

From your nearest Wilson Supply Store you can get equipment and supplies of proven performance,—and prices are always competitive. The Service will always be FULL measure.

Branch Stores

TEXAS: Alice, Corpus Christi, Victoria, McAllen, Bay City, Columbus, Barbers Hill, Liberty, Beaumont, Kilgore, Sherman, Odessa. LOUISIANA: Lake Charles, New Ibera, Houma, Harvey, Shreveport.

Sales Offices

DALLAS SHREVEPORT SAN ANTONIO
TULSA NEW ORLEANS LAKE CHARLES
CORPUS CHRISTI MIDLAND

WILSON SUPPLY CO
HOUSTON, TEXAS

Main Office and Warehouse
1301 CONTI STREET—HOUSTON, TEXAS

The Market Place AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

All Prices as of July 23

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U. S. Gulf Coast, Cargoes
- Gasoline, 98 oct prem. ... 13.25-13.75
- Gasoline, 92 oct reg. ... 11.5-12
- Kerosine ... 9.5-9.75
- Heating oil, No. 2 ... 8.75-9.5
- Gas oil, 48-52 d.i. ... 9.125-9.375
- Fuel oil, bunker "C" ... $2.10-2.15

Carribbean, cargoes
- Avgas, Grade 100/130 ... 16.75
- Gasoline, 93 oct research prem. ... 11.75
- Gasoline, 87 oct research reg. ... 10.5
- Gasoline, 79 oct research ... 9.75
- Gasoline, 70-72 oct motor method ... 9.5
- Kerosine ... 9.5
- Heating oil, No. 2 ... 8.75
- Gas oil, 48-52 d.i. ... 9.125
- Fuel oil, bunker "C" ... $2.10

New York Harbor, barges
- Kerosine ... 10.85
- Heating oil, No. 2 ... 10.35
- Fuel oil, No. 6 ... $2.80

Okla.-Group 3, northern, shpt, bulk
- Gasoline, 88 oct reg. ... 11.75-12
- Kerosine ... 10-10.25
- Heating oil, No. 2 ... 8.875-9.5
- Fuel oil, No. 6 ... $2.00-2.20

Chicago, bulk
- Gasoline, 91 oct reg. ... 13-13.25
- Heating oil, No. 2 ... 10-11.1
- Fuel oil, No. 6, high sulfur ... 7.7-8.05

Los Angeles, rack
- Gasoline, 84 oct reg. ... 12.9-13
- Diesel fuel, PS 200 ... 9.9.8
- Light fuel, PS 300 ... $2.65
- Heavy fuel, PS 400 ... $2.15-2.25

Natural Gasoline, Grade 26-70
- FOB Group 3 ... 4.5
- FOB Breckenridge, Tex. ... 4

LP-Gas—Propane
- Oklahoma (Group 3) ... 4.5

Penna Lubes
- **Bright stock, 25 p.t. ... 27↑**
- **200 vis. neutral, 25 p.t. ... 24↑-25↑**

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent 95 v.i. ... 24-25
- Neutral, solvent 200-210 vis. ... 19.75-20.75

Gulf Coast Lubes
- Bright stock solvent, 95 v.i. ... 25
- Neutral, solvent, 200 vis. ... 21.5

Eastern Hemisphere

Singapore, cargoes
- Avgas, Grade 100/300 ... 18.375
- **Gasoline, 79 oct research ... 10.625↑**
- **Gasoline, 70-72 oct motor method ... 10.375↑**
- **Kerosine ... 10.375↑**
- **Gas oil, 48 d.i. minimum ... 10↑**
- **Fuel oil, light ... $3.40↑**

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, 36.0-36.9 ... $2.82
- North Dakota, 36.0-36.9 ... 2.82
- Texas:
  - **Gulf Coast, low cold test, 26.0-26.9 ... 3.05↑**
  - Gulf Coast, upper and lower, 26.0-26.9 ... 2.82
  - West Texas sweet, 36.0-36.9 ... 2.82
  - West Texas-New Mexico intermediate, 36.0-36.9 ... 2.75
  - West Texas-New Mexico sour, 32.0-32.9 ... 2.61
  - East Texas, flat price ... 2.90
  - Mirando, 28.0-28.9 ... 3.11
- Illinois Basin, flat price ... 2.90
- Penna Grade, Bradford dist, flat price ... 4.57
- California, Signal Hill, 21.0-21.9 ... 2.41†
- North Louisiana-Arkansas, 36.0-36.9 ... 2.82
- Wyoming sweet, 36.0-36.9 ... 2.75
- Wyoming sour, 32.0-32.9 ... 2.48

Canada (flat prices, at the well)
- Acheson-Stony Plain (Alta.) D-2, D-3, L. C. ... 2.54
- Leduc-Woodbend (Alta.) D-2, D-3 ... 2.60
- Redwater (Alta.) D-3 ... 2.49
- Daily-Mississippian (Man.) ... 2.34
- Smiley-Viking (Sask.) ... 2.26

Venezuela (Cargoes, FOB lifting port designated)
- Cumarebo, 48.0-48.9, Tucupido ... 3.40
- San Joaquin, 41.0-41.9, Puerto la Cruz ... 3.04
- Oficina, 35.0-35.9, Puerto la Cruz ... 2.80
- Tia Juana Medium, 26.5-26.9, Amuay ... 2.30*
- Bachaquero, 16.5-16.9, Amuay, Las Piedras ... 1.90**
- Tarra, 38.0-38.9, Cardon ... 2.91
- Lagunillas Heavy, Amuay, Cardon, Las Piedras, flat price ... 2.05

Differential per ½ deg. grav.: (*) 2.5¢ bbl. (**) 3.5¢ bbl.
†Differential per deg. of grav. varies.

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabian, 36.0-36.9, Ras Tanura ... 1.97
- Basrah, 32.0-32.9, Fao ... 1.79
- Iranian, 34.0-34.9, Bandar Mashur ... 1.91
- Iranian, 34.0-34.9, Abadan ... 1.86
- Iraq, 36.0-36.9, Fao ... 1.87
- Kuwait, 31.0-31.9, Mina-al-Ahmadi ... 1.72
- Qatar, 39.0-39.9, Umm Said ... 2.06

Middle East, Eastern Mediterranean
- Arabian, 36.0-36.9, Sidon ... 2.46
- Iraq, 36.0-36.9, Tripoli, Banias ... 2.46

Far East, (Cargoes, FOB Lutong, Sarawak)
- Seria Light, 37-38 ... 2.60

KEY TANKER RATES

(Last paid, per long ton, single voyage)

- U. S. Gulf-New York, clean ... (USMC +70%) $4.85[1]
- U. S. Gulf-N. Y., dirty ... (USMC +57½%) $4.49[2]
- **NWI-USNH, dirty ... (USMC +32½%) $3.58↓[3]**
- **NWI-UK/Cont., dirty ... (Scale +65%) 53/7*↓**
- **Pers. Gulf-UK/Cont., dirty (Scale +85%) 94/9*↓**
- **Pers. Gulf-USNH, dirty ... (USMC +25%) $15.88↑**

**Sterling Owners asked: (1) $4.85/5.13 (USMC +70/80%); (2) $4.28/4.42 (USMC +50/55%); (3) $3.58/3.65 (USMC +32½/35%).*

The Market Trend

This page will be perforated from now on so that you can tear it out and file it if you wish.

Situation Normal—Deals and More Deals

Big deals still rule the marketplace. It's the long-pull trade that is the order of the day, while the one-shot barge or cargo trade languishes.

A 9-million-bbl. purchase was closed by a Socony Mobil affiliate. The company will buy from 5,000 to 6,000 b/d in a five year offtake deal from Commonwealth Oil & Refining's plant in Puerto Rico. Socony will furnish the crude.

Here's one that eventually will show up in the import figures: A West Coast major just came into the market for 10,000 b/d of foreign crude for ten years. He's dickering with producers both in Venezuela and in the Middle East. In other West Coast trades, two refiners—one major and one independent—have optioned to step up contract quantities of their imports in the years ahead.

In Japan, a big independent refiner-marketer is closing on a long-term crude-purchase deal in the Middle East. The quantity will be about 10,000 b/d, and the term will be ten years at a minimum.

And down in Brazil the government just gave approval for a refiner to import Venezuelan crude to his plant 1,200 mi. up the Amazon. The actual deal had been worked out months ago. The Amazon refiner came in the market when his supplies of Peruvian oil were cut off.

All these deals are, in effect, trading against the future. The big operators are pulling together crude sources, tankers to move the oil, refineries to process it, and—finally—outlets for ultimate sale.

This is why no oil in recent years has been in short supply—even in the tightest periods—for more than 90 to 120 days. The shape-up is for highly competitive markets ahead. For if all the big operators make adequate plans for crude, refining, transportation, and outlets—then competition is bound to be rougher than a new pair of corduroy pants.

Heavy Fuel—Long or Short?

Resid markets in the U. S. appear to be weathering the steel strike in remarkable shape. True, there's some talk of using open-pit storage in Oklahoma, but offerings so far have been moderate. A few distress lots went at Chicago at 6.5¢ a gal. At the Gulf, prices for 1% sulfur bunker oil in cargo lots slipped 10¢ a bbl., to $2.15.

But these aren't serious bulges in supply. What's suddenly worrying international companies is that the forward position on bunker fuel now looks easier than it has in a couple of years. All at once there's a surplus in the Persian Gulf. Caribbean refiners aren't turning down new business half as fast as they used to, either.

Jet Fuel:

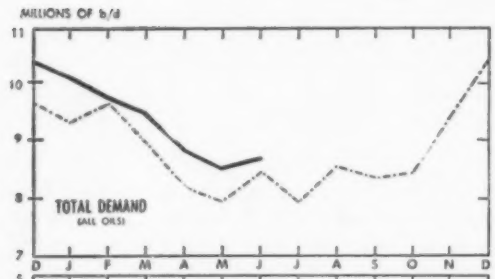
Bidding for the Armed Services 35-million-bbl. jet fuel contract was just as tough as expected (PW—July.20'56,p43). Low price was 8.47¢ for JP-4, f.o.b. the Caribbean.

Gasoline:

Situation of no buyers in the market describes the Gulf Coast cargo trade. Except for 98-octane premium, virtually all grades can be picked up at discount prices, generally 0.25¢ off. Independent refiners who have been sold-up most of the summer now are offering for fall.

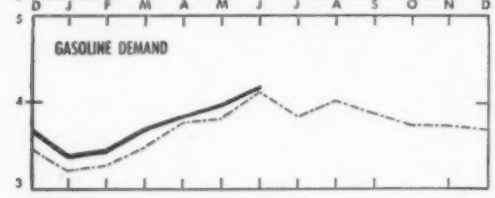
PETROLEUM WEEK'S

Fingertip Figures



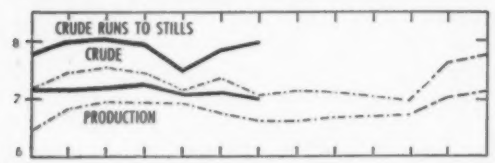
TOTAL DEMAND

Latest 4-week average	8.371
Year ago	8.229



GASOLINE DEMAND

Latest 4-week average	4.089
Year ago	4.061

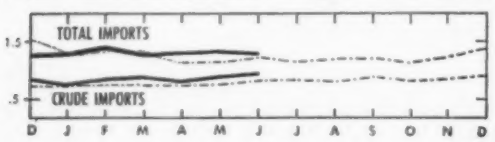


RUNS TO STILLS

Latest week	8.076
Previous week	8.028
Year ago	7.620

CRUDE PRODUCTION

Latest week	7.111
Previous week	7.084
Year ago	6.650



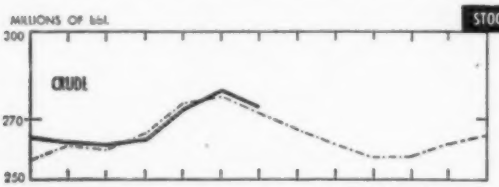
TOTAL IMPORTS

Latest week	1.052
Previous week	1.473
Year ago	.993

CRUDE IMPORTS

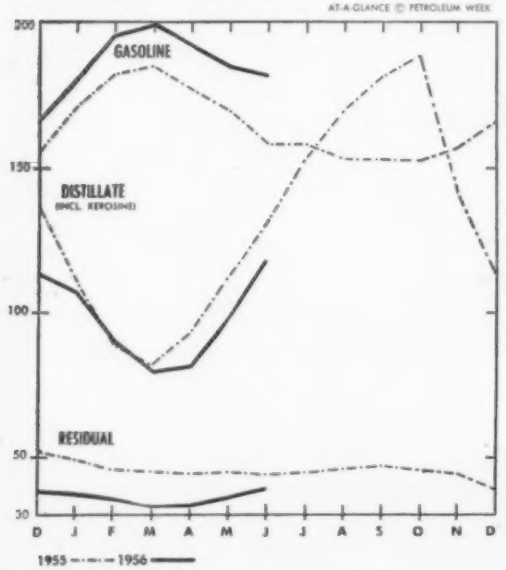
Latest week	.692
Previous week	1.167
Year ago	.763

STOCKS



CRUDE STOCKS

Week ended 7-14	275.1
Previous week	273.3
Year ago	268.8



GASOLINE

Latest week	178.4
Previous week	178.4
Year ago	157.7

DISTILLATES

Latest week	137.5
Previous week	131.9
Year ago	143.6

RESIDUAL

Latest week	42.2
Previous week	40.9
Year ago	45.3

There will be no chance for a reduction in rate of new petroleum supply in the U. S. next month.

This was indicated last week when the Texas Railroad Commission set the August maximum permissible production on a 16-day pattern, a continuation of the July schedule. As of July 14, this amounts to an allowable of 3,384,744 b/d. By Aug. 1, this figure will increase by perhaps 40,000 b/d, due to new wells.

Also importing companies indicate in their reports to the Texas conservation agency that imports of crude oil and products in August will continue well above 1-million b/d. The companies reported to the commission that their imports in August will average 1,257,667 b/d. This estimate, however, will run below actual imports during the month.

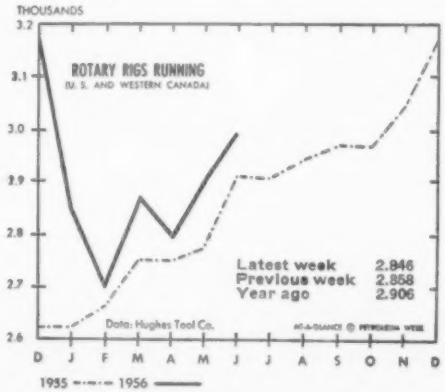
These same companies, for example, estimated last week that imports in July would be 1,230,105 b/d, down a little from June. Actual imports so far in July have averaged about 200,000 b/d above that estimate.

The continued excess of new supply over demand during the normally low-consuming summer months poses a serious threat to the industry's economic situation. This is particularly true in view of the current industrial slowdown caused by the steel strike.

In the first six months of the year, the rate of new supply exceeded demand by 125,000 b/d.

An excess of new supply over demand of about 700,000 b/d is now indicated for July.

It now appear that the stock build-up in August will equal or exceed the July rate, barring an unusually sharp upturn in August demand.


THOUSANDS
ROTARY RIGS RUNNING
(U. S. AND WESTERN CANADA)
Latest week 2.946
Previous week 2.858
Year ago 2.906
Data: Hughes Tool Co.
AT-A-GLANCE © PETROLEUM WEEK
D J F M A M J J A S O N D
1955 1956

SAM N. DeWITT has been named general manager of Voss Oil Co., Newcastle, Wyo. DeWitt was formerly vice-president and general manager of Seismogram Library Corp., and president of Century Corp.

E. H. LYON will manage Phillips Petroleum Co.'s sales department. He succeeds **E. J. Webster,** who is retiring. **John Getgood** succeeds Lyon as Phillips' general sales manager. Getgood was formerly senior assistant sales manager.

JAMES F. BERE has been named general manager of Axelson Mfg. Co., a division of U. S. Industries, Inc. He was formerly general manager of the Hamilton (Ohio) plant of Clearing Machine Co., another division of U. S. Industries. He succeeds **W. W. Greenway.**

MAX C. FIREBAUGH, Collins Bros., has been elected president of the Illinois Geological Society. Other new officers are: **Lester L. Whiting,** Illinois Geological Survey, vice-president; and **Harold Fitzgeorge,** Magnolia Petroleum Co., secretary-treasurer.

R. D. TURNER has resigned as natural gas special assistant to the president of Skelly Oil Co., after 35 years of service. Turner will engage in private gas engineering and consulting work in Tulsa.

GROVER KILGORE, vice-president of sales and advertising for Halliburton Oil Well Cementing Co., has just completed 30 years of service with the company. Kilgore joined Halliburton in 1926 at Duncan, Okla. After working in various fields throughout Oklahoma and Texas, he returned to Duncan in 1947 and was named sales manager.

R. W. EDMUND has been named assistant general manager of Sohio Petroleum Co.'s production department. **Joseph B. Cobb** will superintend the company's Houston production district. **Jerry A. McKnight** succeeds Cobb as district engineer at Lafayette, La. **Zack T. Grapes** has been named assistant district superintendent at Lafayette. Grapes was formerly field superintendent at Lafayette.

MALVIN V. SMITH has been named chief geologist for Century Production Co. at Wichita, Kan. Smith was formerly Kansas geologist for Skelly Oil Co.

J. W. VAIDEN, vice-president of manufacturing, and **J. S. FREEMAN,** vice-president of production, have been named senior vice-presidents of Skelly Oil Co. Vaiden joined Skelly in 1924 and became manager of the company's natural gasoline and gas department in 1934. He became vice-president of manufacturing and a director in 1941. Freeman joined Skelly in 1922. He was general production superintendent before being named vice-president in charge of production in 1948.

C. J. LONG will supervise geophysical operations for the North Texas-New Mexico division of Stanolind Oil & Gas Corp., at Ft. Worth. He was formerly district geophysicist at Midland.

HENRY HOLLAND will superintend Magnolia Petroleum Co.'s Oklahoma City production division. Holland was formerly division petroleum engineer at Midland, Tex. He succeeds **Wade Moriarity,** who has been named assistant production manager at Dallas.

TORKILD RIEBER, chairman of the board of Barber Oil Corp., has been elected to the board of directors of United States Lines. Rieber is a former chairman of the board of The Texas Co. He became president of Barber Oil Corp. in 1942, and was named chairman of the board earlier this year.

LESTER R. MOORE has been elected treasurer of Esso Standard Oil Co. Moore was formerly assistant treasurer of the company. He succeeds **Herbert P. Schoeck,** who has been named executive development coordinator for Esso's parent company, Standard Oil Co. (N. J.).

A. M. BELL, JR., will manage Gulf Oil Corp.'s new production division at Denver, Colo. Bell joined Gulf in 1925 and was later named landman in the company's Wichita (Kan.) office. In 1945 he became general superintendent of production at Tulsa, and in 1955 he was named exploration manager there.

NICHOLAS J. CAMPBELL, JR., a director of Standard Oil Co. (N. J.) has been named to the company's New York law department. Campbell was formerly manager of the law department of Creole Petroleum Co., a Jersey Standard affiliate.

T. H. ATKINSON has been elected a director of Trans-Canada Pipe Lines, Ltd., and appointed chairman of the company's finance committee, at Calgary, Alta.

E. L. PETREE will manage production for Gulf Oil Corp.'s Tulsa division. He was formerly assistant manager of production there. **Dr. Max S. Littlefield** will manage the division's exploration operations. **Paul A. Weirich** succeeds Littlefield as Tulsa division chief geologist.

B. F. HAKE has been appointed general manager of Bolivian Gulf Oil Co. at Cochabamba. He was formerly special adviser for exploration for Western Gulf in California.

JAMES G. NULAND has been elected president of Petrol Oil & Gas Co., Ltd., Toronto, and **Charles S. Lee** has been elected vice-president. Both have been named directors.

C. D. (Chuck) GRAVES will manage operations for Miller & York, Bakersfield (Calif.), drilling contrac-

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For Sale: 1-16 well, Oil Well 80SC Central power Unit, type T-31E-129, connected by 4" shaft to Superior Twin 100 H.P. Engineer, good for 3800 feet. Box 1275, Phone 3434, Kilgore, Texas.

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tors and oil producers. He will be succeeded as superintendent by **William R. Shelton,** former assistant superintendent.

FRED H. WARREN will manage Ohio Oil Co.'s newly created operations planning department at Findlay, Ohio. Warren was formerly general superintendent of the company's eastern pipeline divisions. He joined Ohio Oil in 1939 as assistant chief engineer for a subsidiary, Illinois Pipe Line Co., and was later named general superintendent of the company's trunk and gathering lines east of the Mississippi.

DON CRARY, manager of Sohio Petroleum Co.'s northwest division, has been transferred to Oklahoma City headquarters as exploration manager. He will be succeeded by **Howard Shelton,** formerly assistant to the vice-president, operations.

W. VAUGHN ISCHIE has been elected vice-president and general manager of manufacturing for Sinclair Refining Co. Ischie joined Sinclair in 1920 at the company's East Chicago refinery.

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Atlanta 3 — Robert H. Powell, Jr.
801 Rhodes-Harverty Bldg.
Walnut 5778

Boston 6 — Edward A. Callahan, Jr.
350 Park Square Bldg.
Hubbard 2-7160

Chicago 11 — G. L. Hackley, Jr.
W. F. Holbrook
520 North Michigan Avenue
Mohawk 4-5800

Cleveland 15 — J. E. MacArthur
1510 Hanna Bldg.
Superior 1-7000

Houston 25 — David G. Sawyer
724 Prudential Bldg.
Jackson 6-1281

Los Angeles 17 — Peter S. Carberry
1125 W. Sixth St.
Madison 6-9351

New York 36 — Edward A. Callahan, Jr.
Donald R. Thompson
330 West 42nd Street
Longacre 4-3000

Philadelphia 3 — W. A. Potter
Architects Building
Rittenhouse 6-0670

San Francisco 4 — William C. Woolston
68 Post Street
Douglas 2-4600

Tulsa 19 — J. A. Hartley
209 Constantine Bldg.
601 South Boston
Gibson 7-5594

England, London E.C.4 — Herbert Lagler
McGraw-Hill Co., Ltd.
95 Farrington St.

Other Oil Industry Personnel Changes:

Company:	To:	From:
Amalie Motor Oil Co.		
Alfred G. Pawsey	Midwest reg mgr, Cleveland	New England sales rep
American Oil Co.		
William R. Remalia	Mgr, prod supply, transport dept, New York	Mgr, supply, Pan-Am Southern Corp.
Atlantic Refining Co.		
Eugene J. Minahan	Asst gen auditor, Philadelphia	Mgr, acctg research div, Philadelphia
William Ross Cabeen & Associates		
William C. Hooper	Geologist, Oklahoma City	Geologist, Pure Oil Co., Oklahoma City
William C. Carey		
Dolf W. Fieldman	Geological staff, Grand Junction, Colo.	Mgr, Grand Junction office, Eagle-Picher Co.
Frontier Refining Co.		
Jay Olvey	Asst refinery mgr, Cheyenne	
Gulf Oil Corp.		
E. F. Jacobs	Merch mgr, Pittsburgh	Mktg dept, Pittsburgh
Houston Oil Corp.		
Harold Haraldson	Geologist, Calgary	Geologist, Billings, Mont., British-American Oil Producing Co.
Ideco, one of the Dresser Industries		
Jorge D. Serrano	Sales service agent, Mexico City	
Jorge A. Escalante	Sales service agent, Mexico City	
Ken-Mar Oil Co.		
Claud Sheats, Jr.	Geologist, Wichita, Kan.	Natural Gas Oil Corp., Wichita
Lion Oil Co.		
Jim Wiggins	Geologist, Bismarck, N. D.	Denver office
McCullough Tool Co.		
John Watson	Asst eastern div sales mgr, Mid-continent region	Dist sales mgr, Dallas, Ft. Worth
W. H. Harvey	Dist sales mgr, Dallas, Ft. Worth	Sales eng, Victoria, Tex.
Jack Hankla	Mgr, Pampa (Tex.) dist	
Clarence O. Wilson	Sales mgr, Pampa dist	
Gene Polk	Sales eng, Cody, Wyo.	National Lead Co., Baroid Div
Bob Cremer	City sales eng, Tulsa	Sales eng, Healdton, Okla.
National Supply Co.		
John C. Madden	Div tubular mgr, export div, New York	Asst dist mgr, New York
Northern Natural Gas Co.		
Marvin A. Wilson, Jr.	Asst to mgr, gas purchases, Omaha	Cities Service Oil Co.
Rolland Wages	Traffic supervisor, purchasing dept, Omaha	
Ohio Oil Co.		
Allen D. Lodge	Supervisor, tech services dept, Findlay, Ohio	
Rockwell Mfg. Co.		
Russel L. Sylvester	Chief eng, central valve research, devel dept, Pittsburgh	New York Air Brake Co.
Socony Mobil Oil Co.		
John Magee	Geologist, Caracas, Venezuela	Dist geologist, Bismarck, N. D.
Al Golden	Landman, Casper, Wyo.	Asst landman, Bismarck
Stanolind Oil & Gas Corp.		
Robert Sheldon	Landman, Salt Lake City	Landman, Bismarck, N. D.
Shell Oil Co.		
John E. Orrell	Chief mech eng, Pacific Coast area	Mech eng, New York
Tidewater Oil Co.		
Arnold Nelson	Employee rel supervisor, Associated (Calif.) refinery	Asst to employee rel supervisor, Associated refinery
Joe H. Erwin	Supervisor, service station planning, central div, Tulsa	
Charles A. Slikas	Staff asst, Wilmington (Del.) refinery	Process eng, Wilmington refinery
Welex Jet Services, Inc.		
J. E. Brown	Dist mgr, Pawhuska, Okla.	
Western Co.		
Grady Holder	Field supervisor, Rankin, Tex.	
W. H. Seabolt	Dist mgr, Rankin	
Earl Pfaff	Station supervisor, Rankin	
New Ventures—		
T. A. (Slick) Fraser	Independent oil oper, trader, Midland, Tex.	Phillips Petroleum Co., Midland

Can Independents Keep Up?

WILL THE RACE for more management efficiency leave the smaller oil company behind?

That's a question forced on the industry by the new scientific approaches to management being taken by most of the big companies. A good example is the year-old operations-analysis program of Esso Research & Engineering Co. (page 27). Stressing work simplification, it has already brought direct savings of $1-million.

Many majors are well into operations research programs. They are learning to use electronic brainpower to replace human minds and hands for many jobs. They are sending their management people back to college, or to special company courses. They are pushing brainstorming, and other ways of increasing the creativity of employees. The majors are building up to a level of management efficiency that was only a hope a few years ago.

SOME INDEPENDENTS are matching the majors, step by step. But not typically. It's the majors that have the resources to dig deeply into a new field, absorb the losses in experimentation, and come out with a superior technique.

The potential in such activity is so large that it may cause independents to start lagging in management ability. And if this happens, you won't be able to blame the big companies. They are in heated competition with each other, and can't afford to keep doing things the old way. Also, they have the public responsibility to use their resources for better products and services.

WHAT CAN the small company do? It has the opportunity to study and use many of the new management methods. Training in most of them is available at colleges and elsewhere. The majors themselves freely share much of their new knowledge.

A possibility mentioned by New York University's industrial engineering Professor W. R. Mullee (who works with Esso Research) is more advanced training activity by oil trade associations. He says the small companies can thus pool their resources to match those of the majors.

There is danger for the independent in placing too complete a reliance on its traditional on-the-spot experience, ingenuity, and freedom to move quickly. These are high cards, and the independent will continue to hold them.

But the smaller companies should realize that the new management tools of the majors are still being forged. The really big gains in efficiency are still years away. And when they come, the only safe companies will be those with some good new tools of their own.

Dowell's paddle mixing equipment supplies a constant flow of properly mixed materials to the large-volume pumps.

FRACTURE AND ACIDIZE IN ONE ECONOMICAL TREATMENT!

ACID PETROFRAC* is an exclusive Dowell fracturing treatment with double action for better results with less rig time. It uses an acid-in-oil emulsion to fracture and acidize in one operation. Acid constitutes 90 to 95% by volume of the total mixture. The oil phase may be kerosene, diesel oil or crude oil.

Its high acid content with retarded acid properties means deeper penetration, extended drainage pattern and increased permeability. Sand carrying ability is high, up to 6 pounds per gallon—even at high temperatures.

Dowell engineers tailor each Acid Petrofrac treatment to fit your well requirements. Fluids can be premixed or prepared at the well site in Dowell's paddle mixing equipment. The mixture can be regulated to obtain the proper viscosities and fluid loss. Properties which prevent the swelling of silicates in the spent acid solution are inherent in Acid Petrofrac. No gel-breaker is needed. No shut-in time is required.

For more information or service, call any of the 165 Dowell offices in the United States and Canada; in Venezuela, contact United Oilwell Service. Or write to Dowell Incorporated, Tulsa 1, Oklahoma, Department I-75.

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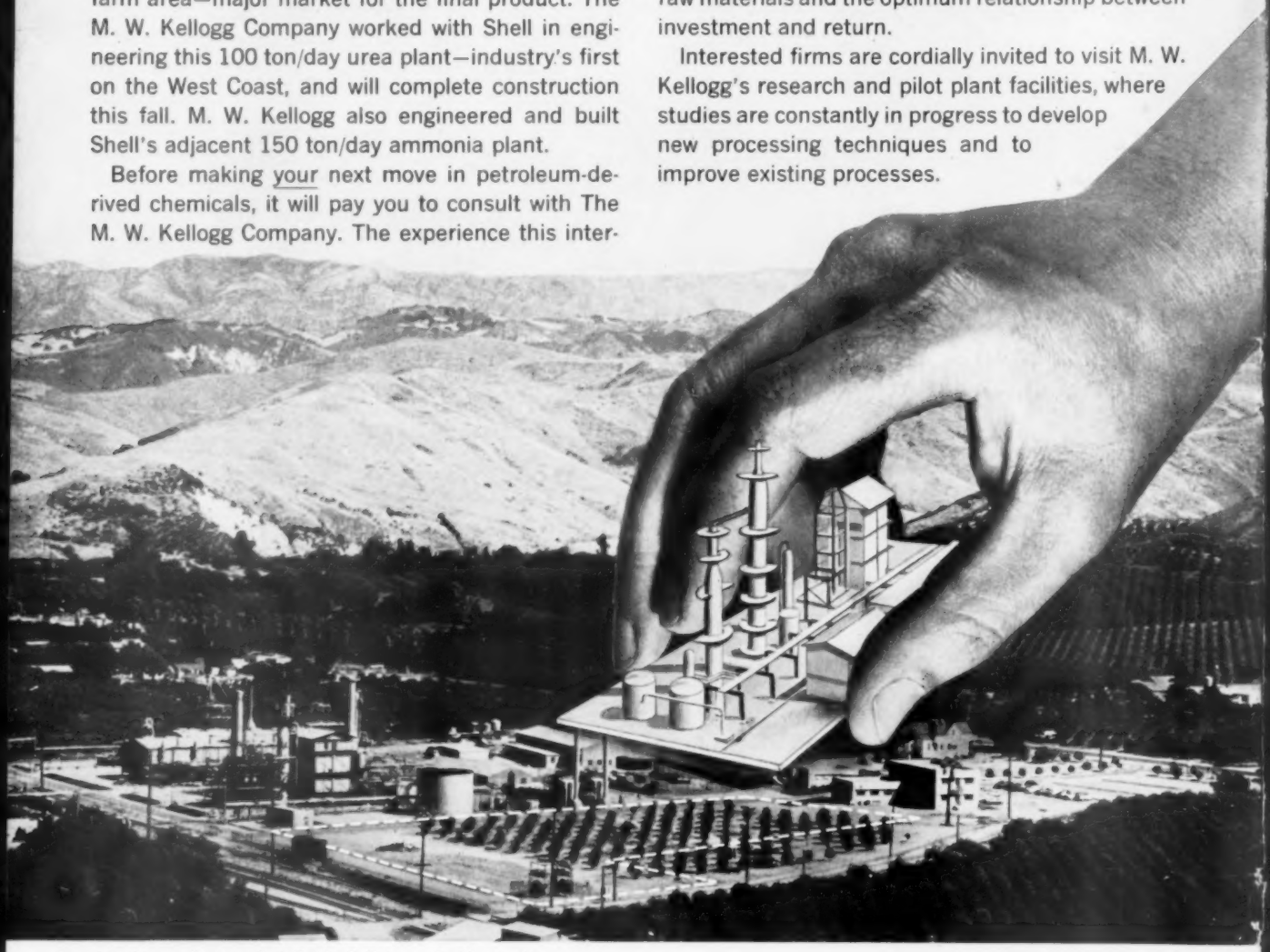
Shell Chemical Corporation made a sound move when it selected Ventura, California for its new urea-nitrogen fertilizer plant. Next door is Shell's ammonia plant—source of raw materials. All around is a rich farm area—major market for the final product. The M. W. Kellogg Company worked with Shell in engineering this 100 ton/day urea plant—industry's first on the West Coast, and will complete construction this fall. M. W. Kellogg also engineered and built Shell's adjacent 150 ton/day ammonia plant.

Before making your next move in petroleum-derived chemicals, it will pay you to consult with The M. W. Kellogg Company. The experience this international engineering organization has accumulated in designing and erecting petrochemical plants for the world's leading chemical and oil companies is your assurance of an early start-up from available raw materials and the optimum relationship between investment and return.

Interested firms are cordially invited to visit M. W. Kellogg's research and pilot plant facilities, where studies are constantly in progress to develop new processing techniques and to improve existing processes.



Site of Shell's new Ventura plant, first in U. S. to use the Montecatini urea process

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